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THE PROGRESS OF OPHTHALMOLOGY

CHAIRMAN'S ADDRESS

HARRY FRIEDENWALD, M.D.

BALTIMORE

The growth of ophthalmology in recent centuries has been vast. Its progress has been remarkable for rapid acceleration. The accumulated mass of ophthalmologic literature has attained huge proportions. It is interesting to pause and survey the paths by which we have arrived at the present state of the science to which this section is dedicated. Such a survey may help to appreciate better what has been accomplished, and what are the factors to which we are indebted for aid in our advance. It will also indicate how such progress has been achieved.

The history of ophthalmology, the history of medicine and the history of the physical sciences go back to a common childhood. In their development they have often been united or closely related, and they have generally been subjected to the same influences. Their development presents interesting analogies.

The ancient Greeks assembled much knowledge concerning the physical world. They laid the firm groundwork of physics, astronomy, mathematics and medicine, centuries before the common era began. They thought deeply concerning natural philosophy, and their speculations brought forth the conceptions on which philosophy, was built. Their wisest teacher, Aristotle, maintained that the source of all knowledge is experience, and that deduction is sound only when based on ascertained facts; he emphasized the essential necessity of careful observation. Unfortunately those who followed him, in their reverence, accepted his system as the complete expression of truth. They worshipped at the altar of authority, and science could not progress; their error led to scientific stagnation. It was not until the thirteenth century that Roger Bacon proclaimed that sophistry cannot be distinguished from demonstration unless we verify our conclusions by experiment and practice.[1] Many years passed before Leonardo da Vinci (1452-1519) and Copernicus (1472-1543) in the fifteenth century and their great followers in the sixteenth century brought about the renaissance of the physical sciences; they introduced experiments which in the seventeenth century merged into an experimental method. All this increased the accuracy of observations and made possible the verification of hypotheses. Thus was modern science born.

Read before the Section on Ophthalmology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Buckley, H.: A Short History of Physics, London, Methuen & Co., Ltd., 1927, p. 10.

Ancient chemistry, aside from methods of obtaining certain metals, was largely metaphysical. The desire to produce gold gave rise to alchemy and to great extension of random experiment; but again it was not until the sixteenth century that a new purpose was infused into chemical studies, when Paracelsus (1493-1541) urged that "the true use of chemistry is not to make gold but to make medicines."

Medicine followed a course similar to that of the physical sciences. When we read some of the ancient Greek medical writings, we are struck with wonderment and admiration and are no less perplexed to find how centuries passed after them in which there was little advance and even great retrogression. The classical period of Greek medicine was in the fifth century B. C., the period of Hippocrates. Medicine had freed itself from magic and incantations, and had come to be founded on observation and experience. Many signs of disease were clearly recognized, and the art of prognosis was developed. As Greek students had met the problems of the physical sciences, so they were led to find an explanation of health and disease by speculation. They brought forth the humoral theory that health is conditioned by balance or equilibrium of the humors; disease by their imbalance. The theory was so simple in form and so satisfactory to the speculative taste that it ceased to be theory and became dogma. The Coan physicians did not recognize or label particular diseases, and hence could not develop diagnosis. Manifestations of disease in various organs were therefore treated only by very general measures and not by local treatment. Anatomy was of no particular interest to them, and was not cultivated until later, and then especially at the Greek School of Alexandria. But much emphasis was laid on sensible hygiene. The Cridian physicians aimed at special pathology, but stressed the disease more than the patient, and mistook mere symptoms for individualized diseases. Speculation continued to flourish, and various systems arose; there were even those who opposed the humoral theory; but while observations were gathered, the great possibilities of hippocratic medicine were not developed, and when, after many centuries the accumulated body of knowledge was systematized by Galen in the second century A. D., his formulation of humoral medicine became the fixed canon for many centuries that followed. Galen's followers were guided by inherited teachings which they believed were all sufficient; they learned what their books taught, held learned disputations and neglected the art of careful observation.

Again it was not until the Renaissance that the studies of Leonardo da Vinci and especially those of Vesalius (1514-1564) established modern anatomy in the middle of the sixteenth century, to be followed in the seventeenth century by Harvey's demonstrations

of the circulation of the blood (1616-1628), founding the science of physiology, and in the eighteenth century by Morgagni's "De Sedibus" (1761),[2] laying the groundwork for pathology.

Anatomy, physiology and pathology are the foundation on which the structure of modern medicine has been built. The building stones have been gathered in many fields and quarries; the rule that has been followed in the building has been: *observe and experiment!* However, it is well to remember that as progress in medicine was long retarded by the tenacious thraldom of ancient authority, so in later periods it was again hindered by unfounded speculations, uncontrolled by experiment.

The history of ophthalmology is bound up with that of medicine and the physical sciences. From the meager literary remains extant, we find that the Greeks, especially those of the later centuries, had a fair understanding of the structure of the eye. The names they gave to the various coats and humors have been transmitted in translation, and are, in large part, those we still use. We also have in common usage some of the medical terms which the ancient Greeks coined. The Greeks had considerable knowledge of pathologic conditions of the parts of the eye that are visible externally, and in their later period practiced couching for cataract. Their erroneous assumption that the lens was the essential factor in vision unfortunately persisted through the centuries. The humoral theory of pathology led the followers of Hippocrates (Coan school) to rely almost entirely on general treatment with the hope of reestablishing the humoral equilibrium, and to give no study to local treatment except in conditions due to local injuries. The Cridian physicians aimed at specific therapy, but their only remedies were purges, milk and whey. This accounts for the universal treatment by bleeding for such conditions as the ophthalmias, a practice that persisted into recent times. Hippocrates used but one form of local treatment for relief of pain in ocular disease—hot applications.

The ophthalmology and the science of optics which the Greeks founded were advanced only little by the Byzantines, who preserved their literary remains. The Arabians, on the other hand, gave much attention to diseases of the eyes and introduced new operations and remedies; they wrote numerous works on these subjects and were far advanced when Greek-Arabic medicine became known in Europe. Knowledge of the diseases of the eye had fallen to low estate in Europe during the Middle Ages. It had not even the dignity of general medicine. The practice was in the hands of quacks and itinerant healers, who were neither physicians nor surgeons.

The Renaissance engendered the struggle against the traditional autocracy of authority. Added to this, the newly discovered art of printing afforded a new means of spreading knowledge. These and other factors gave birth to a new spirit of investigation. But even the Renaissance brought no immediate change in ophthalmology. The introduction of the new methods, the modern plan of accurate observation and experimental confirmation, did not manifest itself equally or simultaneously in all departments of science. In ophthalmology it did not blossom out fully until the nineteenth century.

Vesalius, in his monumental work, did little to correct the old and then current erroneous notions concerning the structure of the eye, though he made some interesting observations.[3] Those who followed Vesalius and applied his methods of accurate dissection and delineation greatly advanced the knowledge of the anatomy of the eye, and the names of some have lasting memorials in our anatomic nomenclature. Progress was slow, and it was not until the middle of the seventeenth century that great advances were made.[4] It must be noted that the progress made in the study of the structure of the eye was for a long time of little influence on clinical ophthalmology, but neither did the general anatomic advances in these early days exert any special influence on the practice of surgery.

Just as the study of form and structure of the body was naturally followed by the study of function, so the study of the physiology of the eye followed that of its anatomy. In 1600, Kepler laid the foundations of modern knowledge of physiologic optics. We must, however, bear in mind that spectacles had been invented three hundred years before and had long been in common use. Following Kepler, during the seventeenth and eighteenth centuries, Scheiner, Mariotte, Huygens and Porterfield made important discoveries in physiologic optics. Again we must note the indifference of practitioners to these advances, made chiefly by physicists, and the feeble influence they had on ophthalmic practice. Perhaps it may not be inappropriate to recall that Kepler excused errors of one of the great physicians writing on the eye "because he is a physician," and a hundred years later Maitre-Jan gave as the reason for his detailed account of the physiology of vision the great ignorance of optics among surgeons.[5]

The erection of the third pillar on which modern ophthalmology rests was begun by Morgagni in 1761, in his studies of cases presenting various pathologic conditions of the eye.[6] A few cases had been published earlier, but Morgagni's work was much more systematic; it was epoch-making in ophthalmology as it was in general medicine. He was followed by Wardrop, whose "Essays on the Morbid Anatomy of the Human Eye," published in 1808, is a work that is instructive to read even today.[7]

It has been pointed out that the progress made in the study of the anatomy and physiology of the eye bore little relation to clinical practice. The explanation is made clear when we remember the strong prejudice of the medical profession against oculists and their operations. Throughout the fifteenth and sixteenth centuries the latter were in sole possession of this field. It was only toward the end of the sixteenth century that works appeared which gave evidence of interest on the part of surgeons in diseases of the eye. Besides a chapter on these diseases in some works on surgery published during the latter part of the sixteenth and in the seventeenth century, there are the books of Bartisch of 1583 in German[8] and of Guillemeau of 1585 in

2. Morgagni, J. B.: De sedibus et causis morborum per anatomen indagatis libri quinque, Venetiis, ex typog. Remondiniana, 1761.

3. Such as that the crystalline lens has the power of a glass lens to enlarge the image of underlying objects, that the retina is the main factor in vision, and that the optic nerve leading to a blind eye was found thin and wasted; the last was the earliest pathologic observation of the kind.

4. The invention of the microscope became of great aid. Leuwenhoeck (1632-1723) described the fibers of the lens, the layers of the cornea and the rods and cones of the retina. The first complete monograph on the anatomy of the eye was published by Zinn in 1755 (descriptio anatomica oculi humani in conibus illustrata, Göttingen, A. Vandenhoeck). Soemmerring's "Abbildungen des menschlichen Auges" appeared in 1801.

5. Maitre-Jan, cited by Hirschberg, Julius: Geschichte der Augenheilkunde, in Graefe-Saemisch: Handbuch der gesamten Augenheilkunde, ed. 2, Leipzig, Wilhelm Engelmann, vol. 13, p. 425.

6. Morgagni, J. B.: Seats and Causes of Diseases, translated by Benjamin Alexander, London, 1769, vols. 1 and 3.

7. Wardrop, J.: Essays on the Morbid Anatomy of the Human Eye, London, 1808.

8. Bartisch, Georg: Augendienst: Newer und wolgegründter Bericht von Ursachen und Erkentnüs aller Gebrechen, Schäden und Mängel der Augen und des Gesichtes, Dresden, M. Stöckel, 1583.

French,[9] devoted only to diseases of this organ. Gradually the subject had become a branch of surgery. With this a new era of progress dawned. Brisseau, in 1709, demonstrated by the experiment of couching and subsequent dissection of the eye that the couched cataract was the opaque lens. From ancient times oculists had couched cataracts in ignorance of what they were doing. It was believed that the lens was near the center of the eyeball and that any injury to it would produce complete blindness.[10]

New works on diseases of the eye based on original observations and experience were published by Maitre-Jan (1707) and St. Ives (1722), translated into many languages and frequently republished. In England, progress was slower, and it was only toward the end of the eighteenth century that English surgeons began to interest themselves in the treatment of diseases of the eye.

Much new experience was gathered in the eighteenth century; important observations were made, but the great and outstanding contribution to science was made by Daviel about the middle of the century—the extraction of cataract.

The medley of ophthalmias, largely tainted by ancient humoral theories, slowly gave way to systematic classification. St. Ives was the first to describe gonorrheal ophthalmia, attributing it to suppression of the urethral discharge. At the end of the eighteenth century, Ware definitely maintained "the possibility of communicating" the inflammation directly to the eye, and urged that great care should be used in handling cloths applied to the patient's eye for this reason. Nevertheless, eminent surgeons like Scarpa and Beer continued to teach that gonorrheal matter entering the eye produces only slight inflammation, and Vetch (1820) made experiments endeavoring to prove this. It is amazing to see how the humoral theory persisted and how it inhibited medical progress. Centuries were spent in conflict, fought with fanatical fury, before it was finally and completely overthrown in the nineteenth century. There is no better example in history of the harmful effects of false doctrines, theories and systems built on speculation and unverified by investigation and experiment.

The forces of progress slowly became overwhelming, and there are clear evidences of this in the clinical writings on ophthalmology. In Lawrence's "Venereal Diseases of the Eye" (1830),[11] clear distinctions are drawn between the syphilitic and the gonorrheal ocular diseases, in which transference of the disease directly to the eye is definitely affirmed. A few years later the extraordinary experiments of Piringer,[12] made by direct transference of gonorrheal matter to the eyes of persons quite blind (from more deeply seated diseases), established the facts. Piringer made his experiments under varied conditions; his records are accurate; his studies were made with precise method, which we regard as completely modern.

In 1750, the first description of the frequency and importance of ophthalmia neonatorum was published and its cause assigned to gonorrheal infection (Quelmalz). Trachoma was not recognized in modern times until the early part of the nineteenth century, although the ancient Greeks had described it, had given it its name and had used the mechanical treatment of brushing the granulations. In the early years of the nineteenth century, Schmidt and Beer, the leaders of the Vienna school, described iritis definitely and distinguished it from the group of ophthalmias. Thus, by these few examples we see how our clinical science progressed—slowly but definitely.

The nineteenth century ushered in one of these great creative geniuses to whom science is indebted in so many fields—Thomas Young—whose studies added much to the understanding of the physiology of vision. His observations were followed a quarter of a century later by Purkinje's, and were capped after another such interval by those of Helmholtz.

Study of the microscopic anatomy of the eye and its pathologic histology progressed notably during the first half of the nineteenth century. In still another direction advances were made of supreme importance to our science, in the isolation of the mydriatic and miotic alkaloids. Belladonna had been known since the early sixteenth century, and extracts had been used in diseases of the eye, but it was only in 1831 that atropine was isolated.[13] It was only after alkaloids had been extracted in pure form that their effects on the eye could be carefully studied and applied with precision. Nor were these the only substances that chemistry presented to us in that period. I need refer only to the iodide of potassium, which was introduced in 1821, and to phenol, which was introduced in 1834.

Returning to the clinical phase, we find that a work like MacKenzie's "Diseases of the Eye" [14] has lost the quaintness of older literature, and in size and general appearance resembles works like those of de Schweinitz or Fuchs. We are amazed at the wealth of knowledge it reveals, and our astonishment is all the greater when we consider the fact that the ocular examinations of that day were unaided by instruments.[15]

The progress made during the first half of the nineteenth century was due to the various factors indicated. In addition, the advances made by general medicine and surgery exerted a stimulating effect on the progress of ophthalmology, for these had, in a large measure, freed themselves from uncontrolled speculation and applied more and more the rule to observe and experiment. The difficulties in deducing general rules and laws in the observation of medical and surgical cases, seen under such a variety of conditions, were recognized by Louis (1787-1872), who suggested the statistical method for the study of etiologic and therapeutic data, a method that has been used to ever increasing advantage in ophthalmology. As in all branches of science, speculation is essential, but it must be subjected to the test of accurate observation and adequate experimentation.

9. Guillemeau, Jacques: Traité des maladies de l'oeil, qui sont en nombre de cent treize, ausquelles il est suject, Paris, C., Massé, 1585.

10. Brisseau's discovery was so revolutionary that his colleagues in Paris urged him not to publish it, for the sake of his reputation.

11. Lawrence, William: Venereal Diseases of the Eye, London, J. Wilson, 1830.

12. Piringer, Joseph F.: Die Blennorrhoe am Menschenauge, Grätz, F. Fersth, 1841.

13. Atropine was isolated in 1831, hyoscyamine in 1833, cocaine in 1855, physostigmine (eserine) in 1864, pilocarpin in 1875 and homatropine in 1879.

14. MacKenzie, W.: Diseases of the Eye, ed. 1, London, Longmans [and others], 1830; followed by the editions of 1835, 1840, 1854, and American editions in 1833 and 1855, besides German, French and Italian translations.

15. It is true that MacKenzie examined "narrowly the surface of a cataractous opacity . . . while concentrating the light upon it by means of a double convex lens," and G. Frick of Baltimore (A Treatise on Diseases of the Eye, Baltimore, F. Lucas, Jr., 1823, p. 79), in discussing opacities of the cornea, examined "the eye laterally, with a magnifying glass." Purkinje used lateral focal illumination in 1823, and even combined it with the use of a microscope in his studies of the iris structure. But the method was so little used even in the early fifties that in two articles that appeared in the first volume of Graefe's Archiv für Ophthalmologie, Hemholtz (in studies on the accommodation) and Liebreich found it necessary to call attention to its great value.

So ophthalmology, when the half century mark was reached, was of far different aspect and was practiced under conditions quite different from those of earlier centuries. Ophthalmology, which had once been despised as disreputable by the medical profession, had later been accepted as a poor foundling by the surgeons, had gradually found those who were ready to devote themselves exclusively to her service and had finally become the legitimized daughter. But like many deep-seated prejudices, this one persisted until very recent times. Weir Mitchell has said: "I can remember when older physicians refused to recognize socially a man who devoted himself to the eye alone."

The middle of the nineteenth century has been described by Jeans as "a time when science was advancing at a greater pace than had ever been known except possibly for two brief periods . . . in the lives of Galileo and Newton respectively." It is not without significance to note that in ophthalmology it produced a galaxy of scientists: Helmholtz, physicst and physiologist, whose great contributions were crowned by his gift of the ophthalmoscope;[16] Donders, physiologist and ophthalmologist, who reduced the whole subject of refraction to a form so simple that every physician interested in the eye could understand it; Bowman in London; Arlt, then in Prague, Desmarres in Paris, and others. And in this brilliant firmament there appeared, like a great comet, Albrecht von Graefe, who applied the invention of Helmholtz to clinical use, and with his colleagues and disciples disclosed to science many of the secrets of that hitherto mysterious and hidden chamber behind the pupil of the eye. Helmholtz published the description of his ophthalmoscope in the autumn of 1851;[17] von Graefe returned to Berlin to devote himself to ophthalmic practice in November, 1851, and found the publication of Helmholtz on his desk. The speed with which the instrument was put to use is shown by the number of articles and monographs that appeared in the next few years, and especially in the work that emanated from von Graefe and his disciples.[18]

16. It is interesting that Wharton Jones, in his review of the early literature on the ophthalmoscope (Brit. & Foreign Med. & Chir. Rev., October, 1854), mentioned the following: "It is but justice that I should here state, however, that seven years ago (1847) Mr. Babbage showed me the model of an instrument which he had contrived for the purpose of looking into the interior of the eye. It consisted of a bit of plain mirror, with the silvering scraped off at two or three small spots in the middle, fixed within a tube at such an angle that the rays of light, falling on it through an opening in the side of the tube, were reflected into the eye to be observed, and to which the one end of the tube was directed. The observer looked through the clear spots of the mirror from the other end." Wharton Jones makes no further mention of Babbage. In "The Principles and Practice of Ophthalmic Medicine & Surgery" (ed. 3, London, J. Churchill & Sons, 1865), he described "the ophthalmoscope in its original forms as invented by Dr. Helmholtz." It is surprising to read in Duke-Elder's "Recent Advances in Ophthalmology" (Philadelphia, P. Blakiston's Son & Co., 1927, p. 14): "The greatest stimulus which ophthalmology has ever known was the introduction of the ophthalmoscope by Babbage in the middle of the last century."

In this connection, it is interesting to note that Purkinje, in 1823, observed accidentally that he could see the eyeground of a dog by means of the light of a candle reflected by his concave glasses. He then tried the experiment on human beings, and observed the same phenomenon. He experimented with an artificial eye which he constructed so as to be able to fill the interior with clear or cloudy fluids, and he maintained that "no membrane or internal liquid substance (of the eye) will now remain hidden to the inspecting eye with light properly reflected, which . . . will prove not without use in the diagnosis of the eyes." But no attention was paid to this until it was disinterred three-fourths of a century later by the historian Hirschberg (Geschichte der Augenheilkunde, in Graefe-Sameisch: Handbuch der Gesamten Augenheilkunde, Leipzig, Wilhelm Engelmann, vol. 16, p. 93).

17. Helmholtz described his ophthalmoscope at the Physical Society in Berlin in December, 1850. On Nov. 11, 1851, he made his first public announcement before the Society for Scientific Medicine in Königsberg. His booklet appeared in the fall of 1851.

18. Von Graefe took his M.D. degree in Berlin in 1847; he then spent three years in foreign travel. In 1852 he became privatdozent; in 1854 he began the publication of the Archiv für Ophthalmologie, now in its seventy-eighth year. In 1857 he was made extraordinary professor. In that year (he was then 30 years of age) he announced the discovery of the curative treatment, by iridectomy, of glaucoma; in the same year he called together the first meeting of the Heidelberg Ophthalmological Society. Four years later he developed tuberculosis, but he continued his labors until he died on July 20, 1870.

The genius of von Graefe, Helmholtz, Donders and of the stars of lesser magnitude and the greatly increased number of those now interested in the practice of ophthalmology in a measure explain the rapidity with which our science now developed. A vast number of new clinical pictures were revealed by the ophthalmoscope; their relation to other constitutional or organic diseases was discovered; but besides ophthalmoscopic examination, many other methods of examination of the eye and of vision were cultivated: careful examination and measurement of acuity of vision, of peripheral vision, of the light sense; methods of measuring and recording various forms of diplopia, ophthalmometric measurements, etc. The visus defiguratus, interruptus, nebulosus and reticulatus, still defined in the works of the late forties, disappeared, and defects of the field of vision were clearly described by von Graefe and others. These examinations were made by means of screens until the Foerster perimeter was invented in 1869. We must not overlook the fact that although the extension of the fields of vision was known to the ancients, it was Thomas Young, in 1801, who made the first careful measurements and described the limits with accuracy, and Purkinje constructed a perimeter in 1825. The results of his investigations are most interesting, for he described the characteristic differences between direct or central and indirect or peripheral vision, the progressive diminution of visual acuity toward the peripheral limits and also the relative color-blindness of the peripheral field. Von Graefe, a quarter of a century later, introduced this most important method of examination into clinical practice.

We have neither the time nor the need to consider the introduction of the photometer, ophthalmometric studies, etc., but we must take notice of the avidity with which ophthalmologists now accepted these varied instruments of precision and cultivated exact methods of investigation and study. It had not always been so. Weir Mitchell, in one of his classic essays,[19] called attention to this fact. Though Galileo invented a thermometer near the end of the sixteenth century and not long after one was constructed to indicate the temperature in the mouth (Santorini), two and a half centuries passed before the work appeared which is the "foundation of our present clinical thermometry" (Wunderlich, 1868). It was also Galileo who used his pulse to count the vibrations of pendulums and later applied the pendulum in constructing the clock. Kepler before 1600 recorded his counting the pulse. "Pulse measures" were devised at an early period. Two hundred and twenty-five years ago an English physician (Floyer) described a "physician's pulse watch," and almost a century later this "instrument of precision" was "revived." Still it was not adopted in medical practice. Years of struggle over fanciful and special pulses for each variety of disease passed by. It is scarcely a century since the accurate timing of the pulse has become general. It requires more than an actual discovery or invention to make it of service. The time must be ripe, and the minds of other workers must be ready to make use of it.

Nowhere has it been shown more clearly than during this period of the history of ophthalmology that "the use of instruments of precision . . . has tended to lift the general level of acuteness of observation" (Weir Mitchell) and that "the practice of the experimental method endows with a new vision both

19. Mitchell, S. Weir: The Early History of Instrumental Precision in Medicine, New Haven, Tuttle, Morehouse & Taylor, 1892.

the experimenter himself, and through his influence those who are associated with him in medical science, even if these be not themselves actually engaged in experiment." [20] Thus it is that instruments of precision have not only made observations possible which were wholly beyond the powers of the unaided senses, but the "new vision" has discovered a thousand clinical facts which lay open to view to numerous generations of physicians, but were unseen by them until their eyes had thus been trained.[21]

The quarter of a century following the introduction of the ophthalmoscope was one of the greatest progress. The influence of von Graefe and his school was rapidly diffused throughout the western world. Archives, journals and monographs bore a large harvest of ophthalmoscopic and other contributions. Many new disease categories were accurately described, their etiology studied and their relations to general diseases and to disorders of other organs established. The relations in particular diseases of the nervous system opened up a new field of knowledge equally significant to the neurologist and the ophthalmologist. Weir Mitchell referred to this period in these words: "Medicine does not grow in an even fashion . . . Today it is surgery which wins; a few years ago it was ophthalmology, which in newly acquired precision and in predictive accuracy and therapeutic gains, set up for us novel standards of exactness and, enriching our symptomatology, cast light in many directions.[19]

The momentum of the third quarter carried over into the fourth. Not only was much in the way of detail added to what had been contributed before, but new lines of investigation were introduced. Chief among those were the bacteriologic. Pathologic histology yielded a rich harvest. New methods of examination were introduced: Skiascopy and the ophthalmometer of Javal proved great aids in the accurate determination of refraction. The ocular muscular relations were subjected to greater study. Antiseptic and aseptic surgical technic was applied in ophthalmic surgery. Local anesthesia was introduced by Koller through his discovery of the anesthetic effect of cocaine, and thus was a return made to general surgery for its gift of general anesthesia. Many advances in other branches of medicine had equally great bearing on ophthalmology. Let a single example suffice: The study of the anatomy of the brain opened up to our knowledge the centers of vision and the course of nerve bundles in the optic nerves and tracts. Advances of notable significance were made in the field of the prevention of blindness; foremost, of course, was that of Credé, the greatest single accomplishment in the prevention of blindness in the entire history of medicine. Ophthalmologists gratefully acknowledge their indebtedness to the noted obstetrician, one of the outstanding benefactors of mankind.

The first third of the twentieth century is almost completed. It has added little in the discovery and description of new disease categories excepting in relation to those associated with the pituitary gland, with vitamin deficiency and nutritional disturbances and with encephalitic diseases that have appeared in recent years. But important advances have been made in the diagnostic and therapeutic use of the x-rays and radium. The successful application of the microscope to the examination of the anterior segment of the eyeball has enabled us to study pathologic changes and processes during life which were formerly only to be observed in the laboratory. Improvements have been made in the ophthalmoscope which have increased the precision of examination, such as the elimination of reflexes, the use of illumination with light of different colors and especially with red free light and with monochromatic light and the correction of spherical and chromatic aberration.

There has been much experimental study bearing on the nutrition of the various parts of the eye, the chemical changes in the intra-ocular fluids, studies which we believe are destined to throw light on those obscure processes leading to the various forms of cataract and glaucoma. The effects of various forms of radiant energy on the eye have been carefully investigated. In many ways research has been directed to solve the many problems which the eye presents, whether considered anatomically, physiologically, embryologically or pathologically.

The introduction of instrumental aids, the spirit of research of great teachers and the extraordinary development of physical and biologic sciences, which gave inspiration to every department of science and medicine, explain the marvelous growth of ophthalmology since the middle of the nineteenth century. The development of ophthalmology as a special science did not separate it further from general medicine and surgery and the underlying branches of medical science, nor even from physics, chemistry and biologic sciences. On the contrary, it bound them closely together. With medicine in general the relation became most intimate, in research and in practice.

It is hardly surprising that a clever critic like Dr. Joseph Collins [22] should express the view: "Very little remains to be discovered in ophthalmology. Its problem is to apply to the eye the discoveries made in the field of general medicine and early to detect some diseases of the vascular and nervous system." Ophthalmologists will appreciate the compliment and pardon the error because Dr. Collins is a neurologist and not an ophthalmologist. We know that methods of examination have reached a high degree of accuracy, but there is not a day when each one of us is not perplexed by problems that we cannot solve: the interpretation of our observations, the analysis of their clinical significance, the discovery of their etiology. It may be satisfactory to some of us to deal with cases in a routine manner, to send our patient to different specialists besides the internist in the hope that they will find something wrong; how few mortals do not have an abundance of physical defects—besides others. How rarely do we have satisfactory evidence, even when our patient recovers from the ocular disease after the "foci of infection" are removed, that there was a causal relation. Is there not much similarity in this confidence to that of our professional grandfathers who found much comfort in their shotgun prescriptions? Do we not sometimes confound therapeutic expediency with established fact? It is well to bear in mind that our aforesaid grandfathers were quite as convinced of

20. Allbutt, T. C.: Medicine, Encyclopedia Britannica, ed. 11, New York, Encyclopedia Brittanica, Inc., 1910.

21. Clifford Allbutt (footnote 20) illustrated this as follows: " . . . the clinical features of many . . . diseases, such, for example, as that named after Graves, and myxoedema . . . lay as open to the eye of the physicians in the past as to our own . . . the symptoms of tabes dorsalis were distinctive enough, had (they) noted them." To these we may add Hutchinson's triad of signs of inherited syphilis, published in 1863.

22. Collins, Joseph: The Progress of Medical Specialties During the Past One Hundred Years, in Celebration of the Centennial of the Library of the Medical and Chirurgical Faculty of the State of Maryland, Baltimore, 1931.

many of their etiologic explanations and therapeutic measures as we are. Should it not be a warning to us to keep well in mind what is theory and what is established fact? We must still remember the lessons of Francis Bacon and guard ourselves against the worship of the idols that lead us to generalizations from insufficient data and those that lead us to error from false philosophies. Let us leave their worship to the practitioners of the "fads" and "kindred delusions" of medical quackery.

We hear much about our "machine age" and the disappointment that instead of relieving human toil and suffering it has in many ways increased them. We ophthalmologists also find ourselves in a machine age, in the era of instruments of precision. A modern ophthalmic consulting room has the appearance of a physical laboratory. But this development has been only of benefit to both patient and physician. It must, however, always be borne in mind that instruments are only aids to observation; observation is useful only when it passes through the mill of careful thought and reflection. Instruments enable us to see; they can neither observe nor think for us.

It would be interesting to follow the development of those institutions and implements which have aided and encouraged the study and diffused the science of ophthalmology, the special professorial chairs in medical colleges and universities, hospitals for ocular diseases, ophthalmologic societies and the ophthalmologic literature, but this is not necessary. We are all familiar with the part they have played.

With every advance of knowledge, new vistas of the unknown open themselves before us. The problems become more and more intricate; they deal with the fundamental processes of nutrition and repair, with the reactions of tissues, cells and protoplasm to the many substances from without and from within the organisms that act on them. Investigations require the aid of general physiologists and pathologists and of biochemists in cooperation with clinicians. It is in the line of natural development that university laboratories and institutes of ophthalmology have been founded in recent years, for only through them can such cooperation in scientific investigation be secured. It is from them that the next great advances in ophthalmology are to be looked for.

Physical Defects in Geniuses.—Most of the great philosophers of history, and a great many of the poets and writers of fantastic tales, have been men and women who have been unable to see the world about them and have compensated by inventing a world of visual images to help them supplement their actual vision. . . . It will repay you to read the lives of eminent artists, poets, philosophers, novelists and astronomers to learn how others, similarly affected, have brought beauty and knowledge and solace into the world. The blind Homer, who gave the world the glories of the Odyssey and the Iliad, is an example of a splendid line of courageous men and women who have not been daunted by their defects, a line that includes Goethe, Spinoza, Goya, Whistler, Braille, Helen Keller and others equally notable. Similarly that deaf giant Beethoven points the way to compensation for defects of hearing. Demosthenes, the stutterer, became the greatest orator of ancient times. Moses, also a stutterer, became a great religious leader. . . . John Hunter, the English physician who first described angina pectoris, died of the disease he discovered and first described. Investigate any genius and you will find that he is compensating for some organic or other defect by intensive training in the compensation of his anomaly in terms of social usefulness.—Wolfe, W. B.: How to Be Happy Though Human, New York, Farrar & Rinehart, 1931.

THE DIET IN BRIGHT'S DISEASE

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The diet which is gaining recognition today as suitable for the patient with Bright's disease is radically different from that of the past. Formerly, in treating this disease, physicians thought only of the kidney; today, in keeping with modern ideas of treatment, the chief consideration is for the patient himself. It was the custom to think only in terms of protein catabolism and of the harmful effects of its end-products, and consequently the patient was told that he must eat no meat. Now attention is directed to the anabolic influences of protein, its upbuilding effects and beneficial influence on repair processes, and the patient is told to take liberal amounts of this essential foodstuff.

The whole protein problem is a much vexed one. Undue emphasis has been laid on the supposedly harmful effects, even in health, of nitrogenous degradation products, while the essential rôle which protein plays in repair processes and in the maintenance of vigor seems to have been largely overlooked. It is not possible here to discuss the mass of testimony, pro and con, which has been obtained from human observation and animal experiment, but it seems fair to say that the weight of evidence would indicate not only that a large protein intake per se is without harm but further that if man would enjoy full health and sustained vigor his consumption of protein food must of necessity be liberal. This applies not only in health but in large measure in disease as well, notably in Bright's disease.

A distinguishing feature of Bright's disease in its acute hemorrhagic and chronic degenerative forms is a marked loss of body protein. The infection which causes acute nephritis, whether it be of scarlet fever or tonsillitis, or some other form of bacterial invasion, produces, first of all, a toxic destruction of body protein; then as the disease progresses there follows a marked loss of albumin through the urine, which entails an excessive drain on the body proteins and results finally in a measurable plasma protein deficit. This deficit in turn profoundly upsets water balance. It was demonstrated years ago by Starling, and more recently illustrated by Christian [1] in his Frank Billings lecture, that water exchange between the capillaries and the tissue spaces is largely controlled on the one hand by the osmotic pressure of the serum proteins and on the other by hydrostatic pressure within the capillaries, and that as the former diminishes through loss of plasma proteins, particularly of serum albumin, this balance is upset and fluid leaves the vessels to accumulate in the tissues. In this manner is produced the edema of Bright's disease.

Not only do these changes in osmotic pressure produce edema but in nephritis, as Van Slyke and his associates have shown, the plasma protein deficit clearly influences the course of the disorder. These clinicians found that if the body proteins of the patient with acute nephritis could be sufficiently protected, the disease would tend toward recovery, but not if an albumin deficit was permitted to continue. They said: "In acute hemorrhagic nephritis the prognosis was found to be independent of the severity of the disturbance during

Read before the Section on Pharmacology and Therapeutics at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Christian, Henry A.: The Mechanism of Edema, J. A. M. A. 97: 296 (Aug. 1) 1931.

the first weeks with the single exception of the plasma albumin content. The majority of cases in which this fell to a low level became chronic." [2] Thus, it would appear that in acute hemorrhagic nephritis the chances for complete recovery depend largely on one's ability to compensate for the protein loss. This can be accomplished in but one way: by permitting a liberal intake of protein, adequate in amount to make good the deficit.

Is there danger that such a ration will, through the end-products of protein degradation, throw a disastrously heavy burden on the sick kidney? Experience has shown that it will not. It should be recalled that deposit protein and that used for the replacement of wear and tear make no demand on the excretory organs and therefore cannot injure the kidneys, and that this fact applies to the larger part of the protein eaten by any person who has suffered from protein shortage. In other words, the increased amount of protein food now recommended for the patient with Bright's disease can have no direct influence on the kidney; it is used entirely for purposes of replacement, and in this manner makes for recovery. Especially significant is the recent report of McCann,[3] who told of a young boy with acute hemorrhagic nephritis whose disease had reached a stationary stage when his protein allowance was increased from 75 Gm. to the very liberal amount of 150 Gm. daily, and who thereupon showed immediate and marked improvement. This change was accompanied by numerous graphic evidences of betterment, such as an increase in the serum proteins and in the carbon dioxide-combining power of the blood, an improvement in the blood urea clearance and a material decrease in the number of red blood cells and casts in the urine. My own experience with acute nephritis has been similar. It appears established that, as a rule, patients with this disease can with relative impunity be given a liberal protein diet, and that such a diet facilitates recovery.

It is difficult to state accurately the amount of protein which should thus be included in the ration of an adult with acute and subacute nephritis. The daily allowance at the present time is usually between 40 and 50 Gm., but judging by my own experience as well as the carefully controlled experiments of McCann and others, one would conclude that approximately three times this amount, that is, 150 Gm. daily, is more nearly correct. The composition of the diet in other respects also is of importance. Since the total quantity of food should be ample to meet the patient's metabolic needs, there should be included, in addition to the protein quota, fats and carbohydrates in amounts sufficient to cover his requirements for energy. For economy in nutrition, carbohydrate should provide at least 50 per cent of the caloric value of the ration, preferably more; only in this way can it be assured that the protein of the food will be used for purposes of repair rather than burned for the production of energy. The type of food chosen, provided these specifications are met, is of little importance, with one exception: The protein should in large part be of high biologic value such as is found in meat, milk and eggs. In general it can be said that if the adult with nephritis takes a quart of milk daily, two eggs and one large serving of meat, his need for protein will be covered and no harm will be done his kidneys.

This need for a liberal protein intake is imperative, not alone in acute nephritis, but in that form of chronic nephritis which has been called degenerative Bright's disease by Addis, and chronic nephritis with edema by Christian, for in this disease also, as a result of the long-continued albuminuria, there is a marked loss of body protein. That the tubular degeneration will tend to continue indefinitely if the loss of body protein is not replaced was indicated by the experiments in Christian's clinic by Barker and Kirk,[4] who were able to study in dogs, by means of plasmapheresis, a condition closely simulating this form of Bright's disease. Whether the edematous disorder described by Epstein [5] under the term nephrosis is a distinct disease entity or is identical with chronic degenerative Bright's disease is still debatable, but a profound albumin deficit is characteristic of both. For this reason the experience of this clinician with his high protein diets in the former disease is applicable also in the latter. Degenerative Bright's disease can be influenced in no small measure by the liberality of the protein intake.

Conditions of a somewhat different nature obtain in the other type of chronic nephritis, nephrosclerosis. This, in its ultimate nature, is a disease of the arteries rather than of the parenchymatous tissues and, except in the malignant form, its manifestations as well as its outcome depend on circulatory failure rather than on renal incompetency. Van Slyke found in his cases that the plasma protein content was entirely normal; hence the need for protein is not so urgent as in acute hemorrhagic nephritis or in chronic degenerative Bright's disease. On the other hand, except in the terminal stage with its low urea clearance, there is no reason for restricting protein; indeed, there are excellent reasons for providing an amply sufficient intake of this foodstuff. I am sure that much of the anemia and lack of endurance seen in this type of chronic nephritis is due to the unnecessarily rigid dietary restriction to which the patient is so often subjected. This is a disease not of days or weeks, or even of months, but of years and decades, and it is important to prescribe a regimen which will preserve the patient's strength and vigor as long as possible. This can be done only with a diet which carries a liberal supply of good protein.

In conclusion, a more intimate knowledge of the pathology of both acute hemorrhagic nephritis and chronic degenerative Bright's disease would indicate that in both forms of nephropathy the patient should be given diets containing liberal amounts of protein: in the former disease 150 Gm. daily and in the latter even more. Experience has shown that such an allowance facilitates recovery. In nephrosclerosis different conditions obtain, but the diet should be fairly liberal; it should provide approximately 75 Gm. to 100 Gm. of protein daily.

ABSTRACT OF DISCUSSION

DR. W. B. PENNEY, Tacoma, Wash.: Dr. McLester has called to our attention a matter that is one of the most important in the ordinary handling of cases of Bright's disease. In our section of the country, it is common to find the nephritic patient either placed on an absolute milk diet or else given nothing but cereal and milk over periods of weeks and months. Ideas concerning the feeding of patients should be carefully reconstructed.

DR. W. E. GARREY, Nashville, Tenn.: To what extent do nutritional edemas due to lack of proteins act as a contributory factor in the edema of nephritis?

DR. JAMES S. MCLESTER, Birmingham, Ala.: In answer to Dr. Garrey's question, it would appear that the edema that

2. Van Slyke, D. D., and others: Observations on Courses of Different Types of Bright's Disease, and on Resultant Changes in Renal Anatomy, Medicine **9**: 257 (Sept.) 1930.

3. McCann, W. S.: The Many Sided Question of Protein in Nephritis, Ann. Int. Med. **5**: 579 (Nov.) 1931.

4. Barker, M. H., and Kirk, E. J.: Experimental Edema (Nephrosis) in Dogs in Relation to the Edema of Renal Origin in Patients, Arch. Int. Med. **45**: 319 (March) 1930.

5. Epstein, A. A.: Further Observations on the Nature and Treatment of Chronic Nephrosis, Am. J. M. Sc. **163**: 167, 1922.

occurs in the early stage of acute nephritis is complex in its nature and is not well understood, but it seems clear that the edema of the later stages of acute nephritis and that of chronic degenerative nephritis are due to a shortage of protein. Whenever the serum proteins, and particularly serum albumin, are reduced to one half, edema appears.

THE NEUTROPENIC STATE

ITS SIGNIFICANCE AND THERAPEUTIC RATIONALE

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COLUMBUS, OHIO

A growing importance is being attached to the signs and symptoms which have only recently begun to be recognized as associated with a decrease or absence of neutrophilic leukocytes in the peripheral blood. Since the more or less routine counting of the blood cells became a recognized aid in clinical diagnosis, physicians have noted a tendency to leukopenia as a part of certain well known clinical syndromes. Typhoid, influenza, osteomyelitis, tuberculosis, overwhelming infections with the pneumococcus and streptococcus, certain virus diseases, pernicious anemia, aleukemic leukemia, and lymphoblastomas of various types, especially Hodgkin's disease, are, or may all be, characterized by a total white cell count within or below the limits of normal. Various toxic agents—benzene, the arsenicals, mesothorium, trinitrotoluene, x-rays, or the gamma rays of radium—have been found to be the cause not infrequently of profound leukopenia, often with an associated anemia, in individuals exposed to these hazards.

Leukopenia, neutropenia and "agranulocytosis" are, of course, purely descriptive terms, as are leukocytosis, monocytosis and lymphocytosis, and have no etiologic significance; but if in every observation made on the cells of the blood a careful qualitative as well as an accurate proportional differentiation of the formed elements could be recorded, with the variety of technics [1] now available for such studies, far more information than now usually obtains concerning the state of the body defenses and the nature of the pathologic process involved could be brought to bear on the problem presented by a given patient. Moreover, few observers in the past, even though noting coexistent leukopenia in the particular disease under consideration, attributed any of the significant signs or symptoms to this deficiency in white cells. That is to say, leukopenia has always been considered secondary to other factors, and, at most, an unfortunate additional complication in an otherwise generally severe toxemia of nearly, if not quite, lethal proportions.

Roberts and Kracke [2] were among the first to recognize the importance of analyzing accumulated data in terms of white cell level and symptomatology. In a review of the records of 8,000 private clinic patients, one of every four was found to have had a mild granulopenia; one of each two women patients between the ages of 40 and 60 years was neutropenic; and complaints of weakness, exhaustion and fatigue were twice as frequent in the granulopenic individuals as in those showing a normal white cell count. Furthermore, the severity of the symptoms paralleled to a remarkable extent the degree of granulopenia found.

With the recognition by Schultz [3] in 1922 of a rapidly fatal symptom complex designated by him angina agranulocytica, which included progressive oral sepsis of severe grade, marked prostration and a neutropenia in the blood, a new impetus was given to the restudy and analysis of those leukopenic states primarily reflecting a relative and absolute decrease in neutrophilic leukocytes. Friedemann [4] the following year applied the term "agranulocytosis" in a report of similar cases, and Schilling [5] has suggested "malignant neutropenia" as a more fitting descriptive designation. Perry Pepper [6] recently pointed out that "putrid sore throat" probably represents the same condition, as seen and described by the laryngologists of the last century. Most observers, including Schultz, would explain the blood picture in this symptom complex as secondary to a septic or toxic process affecting an aplasia of the myeloid cells in the marrow; i. e., an exceptionally severe manifestation of one of the conditions already mentioned.[6a] Two observations, however, which have been reported in the rapidly increasing literature on this subject, effectively eliminate this hypothesis, at least as the sole explanation for all cases showing these general clinical symptoms and laboratory manifestations: 1. The neutropenia may be periodic and definitely precede the appearance of local signs of infection.[7] 2. Biopsy and postmortem studies are revealing the fact that not in every case of peripheral leukopenia is the bone marrow aplastic for myeloid elements.[8] Thus, Fitz-Hugh and Krumbhaar [8] hypothesize a "maturation arrest" as the fundamental pathologic basis in a portion of these cases and prefer the designation "pernicious leukopenia," which suggests certain analogies between this disease and pernicious anemia. Again is the emphasis placed on neutropenia per se as a sign and not as an etiologic entity, and attention directed toward the importance of differentiating a given "leukopenic state" as to both etiology and underlying bone marrow changes.

It is important in the approach to a consideration of any hypothesis that attempts to explain the mechanism of leukopenia to conceive of the cells of the blood as a tissue, and of those of the bone marrow as constituting an organ [9] with all the potentialities for hypertrophy and atrophy and functional insufficiency that appertain to any other organ or tissue of the body. It has been shown that the bone marrow delivers its cellular products—as vital to the body economy as any hormonal contribution of the ductless glands—in response to an ever-varying functional demand, both the physiologic [10] and the pathologic [11] ranges in cell levels obeying defi-

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Owing to lack of space, several charts have been omitted. The complete article appears in the author's reprints.

1. Doan, C. A.: Clinical Implications of Experimental Hematology, Medicine **10**: 323 (Sept.) 1931.

2. Roberts, S. R., and Kracke, R. R.: Agranulocytosis: Report of a Case, J. A. M. A. **95**: 780 (Sept. 13) 1930.

3. Schultz, Werner: Ueber eigenartige Hulserkrankungen, Deutsche med. Wchnschr. **48**: 1495 (Nov. 3) 1922.

4. Friedemann, U.: Ueber Angina agranulocytotica, Med. Klin. **19**: 1357 (Oct. 14) 1923.

5. Schilling, Viktor: The Blood Picture, St. Louis, C. V. Mosby Company, 1929.

6. Pepper, O. H. P.: History of Agranulocytic Angina, J. A. M. A. **97**: 1100 (Oct. 10) 1931.

6a. Fried, B. M., and Dameshek, William: Experimental Agranulocytosis, Arch. Int. Med. **49**: 94 (Jan.) 1932. Conner, M. H.; Margolis, H. M.; Birkeland, I. W., and Sharp, J. E.: Agranulocytosis and Hypogranulocytosis, ibid. **49**: 123 (Jan.) 1932.

7. Roberts, S. R., and Kracke, R. R.: Agranulocytosis, Ann. Int. Med. **5**: 40 (July) 1931. Rutledge, B. H.; Hansen-Pruss, O. C., and Thayer, W. S.: Recurrent Agranulocytosis, Bull. Johns Hopkins Hosp. **46**: 369 (June) 1930.

8. Dameshek, William, and Ingall, Maurice: Agranulocytosis, Am. J. M. Sc. **181**: 502 (April) 1931. Fitz-Hugh, Thomas, Jr., and Krumbhaar, E. B.: Myeloid Cell Hyperplasia of the Bone Marrow in Agranulocytic Angina, ibid. **183**: 104 (Jan.) 1932.

9. Doan (footnote 1). Sabin, F. R., and Doan, C. A.: Bone Marrow as an Organ, Proc. Soc. Exper. Biol. & Med. **25**:121, 1925.

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nite laws of rhythmic equilibrium or homeostasis.[12] In the normal individual the rhythm of the white cells from hour to hour is in large part a reflection of variation in the polymorphonuclear neutrophils, because they are present proportionately in greatest numbers.[13] The observation by Sabin,[14] in a survey of normal living blood cells, of certain "nonmotile" polymorphonuclear neutrophils, and the later determination[13] of their occurrence in "showers" in the peripheral circulation, suggested to us the hypothesis that the normal stimulus for maintaining the effective "zonal range"[11] of these "defense troops" of the body might be liberated products from disintegrating cells of the same type. This could occur either directly or through the medium of the phagocytic group of cells reducing the débris. The correlation of these "showers of nonmotile leukocytes" in human pathologic conditions with a subsequent increase of young motile neutrophils[11] further supported the concept. This seemed to point to a thorough restudy of the effect of nucleic acid and its derivatives on the leukopoietic system, as these substances must be constantly produced physiologically in the body. The results of that experimental study, begun in 1924, were presented in 1928[15] together with a complete review of the literature on nucleinate therapy up to that time.

On purely empiric grounds, nuclein therapy was suggested, at least as early as 1893,[16] to increase the germicidal power of the blood in diseases of microbic origin. Altmann had isolated nucleic acid for the first time in 1877 from Miescher's "nuclein," obtained from the large residue of nuclear débris constituting the "pus" so readily available from human patients in those days of septic surgery. A little later (1892), Metchnikoff's[17] emphasis on the "phagocytic power" of the polymorphonuclear granulocyte, as the effective means of destroying bacteria, initiated a brief era of intensive cytologic investigation, which, however, was soon overshadowed by the rapidly growing interest in humoral immunity. Thus, the earlier work on the importance to the body of its cellular defenses, to which studies with nucleic acid and its derivatives contributed not an inconsiderable chapter, failed in attaining permanent recognition at that time. It was really necessary for the later physiologic studies on the normal mechanism of leukopoiesis to provide a sound basis for evaluating the effectiveness of agents purporting to stimulate the bone marrow. Now, in the light of modern hematologic studies, it is known that the increase in leukocytes reported and attributed to nucleic acid in the earlier investigations was well within the normal limits of physiologic fluctuation and not of sufficient magnitude probably to influence any pathologic process. Hence, though reports suggesting the effectiveness of nucleinate therapy have continued to appear at intervals,[18] the dosage used was always small: that by Ames and Huntley,[18] from 25 to 45 minims (1.5 to 2.8 cc.) of a 1 per cent solution intravenously in dogs; that by Habetin,[19] 10 cc. of a 5 per cent solution of sodium nucleinate subcutaneously in a wide variety of human cases. Its rationale as a therapeutic agent and the mechanism, if any, invoked by it have remained obscure.

The studies of Doan, Zerfas, Warren and Ames[15] from the Thorndike Laboratory, in Boston, and the Rockefeller Institute, in New York, were directed toward a better understanding of these questions. The definite and usually considerable leukocytosis that followed the intravenous injections of relatively large doses (1 Gm.) of sodium nucleinate in their series of normal rabbits was proved to be unquestionably of bone marrow origin. However, a preliminary leukopenia occurred, sometimes lasting for a number of hours, before the peripheral leukocytosis was observed, an obviously undesirable phase in the reaction. Further studies tended to incriminate the spleen as primarily involved in this temporary withdrawal of granulocytes from the blood stream. Splenectomy eliminated to a large extent the leukopenic period.

It was then determined to see whether this "active principle" affecting the myeloid foci in bone marrow might not be contained in some of the degradation products of nucleic acid, as distinct from the accompanying leukopenia-producing factor of the larger molecule. Henry Jackson, Jr.,[20] was demonstrating the same year from the same laboratory for the first time the existence of pentose nucleotides in normal human blood. The adenine and guanine nucleotides, which he had prepared incident to these studies by the autoclave method of Jones,[21] were generously made available to us for the desired biologic assays. Chemically pure, crystalline adenylic and guanylic acids were later tested through the courtesy and interest of P. A. Levene of the Rockefeller Institute. These products all gave an immediate neutrophilic response without preliminary leukopenia, which recommended them as preferable to the larger nucleinate molecule for clinical use. These experimental studies further revealed the essentially nontoxic character of the nucleotides and suggested the advisability of their use in relatively large dosage when leukocytic stimulation was desired.

Reznikoff[22] made the first clinical application of the implications carried by these experimental studies in four cases of agranulocytic angina, studied in the second Cornell Medical Service at Bellevue Hospital, New York. Three of his patients recovered. Because of the difficulty of securing the nucleotides, he was forced to use the purine bases adenine and guanine.

Jackson and his associates,[23] using first the pentose nucleotides prepared in the Thorndike Laboratory but subsequently directing their preparation on a much larger scale in a commercial laboratory,[24] reported in November, 1931, a series of twenty clinical cases of

12. Cannon, W. B.: Organization for Physiological Homeostasis, Physiol. Rev. **9**: 399 (July) 1929.

13. Sabin, Cunningham, Doan and Kindwall (footnote 10).

14. Sabin, F. R.: Studies of Living Human Blood Cells, Bull. Johns Hopkins Hosp. **34**: 277 (Sept.) 1923.

15. Doan, C. A.; Zerfas, L. G.; Warren, Sylvia, and Ames, Olivia: A Study of the Mechanism of Nucleinate-Induced Leukopenic and Leukocytic States, J. Exper. Med. **47**: 403 (March) 1928.

16. Vaughan, V. C.; Novy, F. G., and McClintock, C. T.: The Germicidal Properties of Nucleins, Medical News, New York **62**: 536, 1893.

17. Metchnikoff: Pathologie comparée de l'inflammation, Paris, 1892.

18. Ames, Delano, and Huntley, A. A.: The Nature of the Leukocytosis Produced by Nucleinic Acid; Preliminary Experimental Study, J. A. M. A. **29**: 472 (Sept. 4) 1897. de Paoli, Erasmo, and Calisti, A.: Beobachtungen und experimentelle Untersuchungen über den Wert den Injektion des nukleinsauren Natriums bei der Prophylaxe der operativen Infektion des Peritoneums, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **24**: 275, 1912. Jacobi, W.: Ueber intravenöse Injektionen hoher Dosen von Natrium nucleinicum beim Menschen, Ztschr. f. exper. Path. u. Therap. **22**: 266, 1921. Gardner-Medwin, F. M.: The Precipitation of the Crisis in the Treatment of Pneumonia, Brit. M. J. **2**: 49 (July 12) 1924. Daubenton, F.: Severe Case of Lobar Pneumonia Successfully Treated with Sodium Nucleinate, South African M. Record **23**: 463 (Oct. 24) 1925.

19. Habetin, P.: Ueber Funktionsprüfung des Knochenmarkes, Wien. Arch. f. inn. Med. **7**: 329 (Dec.) 1923.

20. Jackson, Henry, Jr.: Pentose Nucleotides in Human Blood, J. Biol. Chem. **59**: 529 (April) 1924.

21. Jones, Walter: Nucleic Acids, ed. 2, London, Longsmans, Green & Co., 1920.

22. Reznikoff, Paul: Experimental Leukocytosis and Leukopenia, J. Clin. Investigation **6**:16 (Aug. 20) 1928; Nucleotide Therapy in Agranulocytosis, ibid. **9**: 381 (Dec. 20) 1930.

23. Jackson, Henry, Jr.; Parker, Frederic, Jr.; Rinehart, J. F., and Taylor, F. H. L.: Studies of Diseases of the Lymphoid and Myeloid Tissues: The Treatment of Malignant Neutropenia with Pentose Nucleotides, J. A. M. A. **97**: 1436 (Nov. 14) 1931.

24. The Smith, Kline and French Company, Philadelphia, have supplied us with nucleotide K-96 for our experimental and clinical studies since they have had the material in production. Prior to this, during the past two years we have used the adenine sulphate and guanine hydrochloride secured from the Eastman Kodak Laboratories.

profound leukopenia, with recovery in fourteen following large doses of nucleotide. This series of cases gave the first real opportunity for studying the effect of adequate dosages of the nucleotides in clinical patients showing profound neutropenia. Our own studies during the past two years have been continued along both experimental and clinical lines as opportunities have been presented.

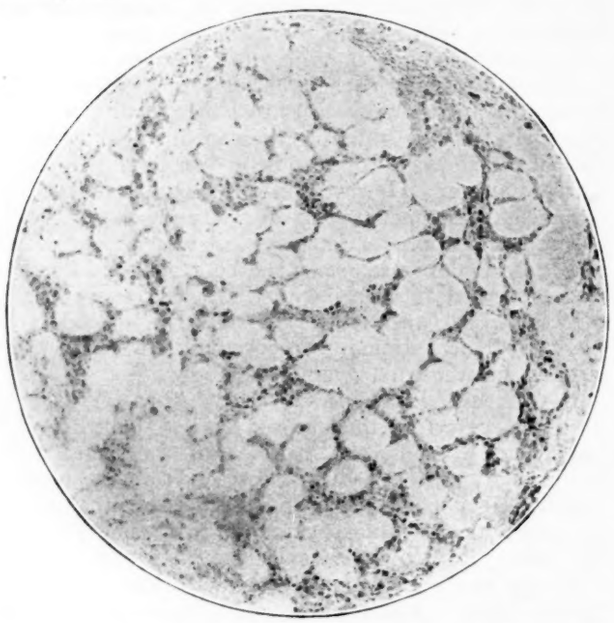

Fig. 1.—Normal bone marrow from proximal end of tibia of rabbit 0-490, removed at biopsy prior to nucleotide injections. There is a predominance of fat cells and sparsely scattered hematopoietic foci; reduced from a photomicrograph with a magnification of 100 diameters.

EXPERIMENTAL STUDIES

Having proved that nucleic acid and its derivatives had a definite effect on the myeloid foci in the bone marrow,[15] we decided to give repeated daily injections of this material to normal rabbits over a prolonged period to determine the capacity of the bone marrow to respond under such circumstances. Could the normal mechanism of maturation and delivery be broken down under such continuous bombardment with the development of an uncontrolled marrow hyperplasia and with the appearance of a leukemic arrhythmia in the blood, or might it be possible to exhaust the ability of the marrow to respond with the gradual development of a relative hypoplasia or aplasia for myeloid elements? Starting with 50 mg. doses, the dosage of sodium nucleinate was gradually increased to 1 Gm. daily given into the ear veins of two rabbits, the period of observation extending for 102 and 116 days, respectively. Throughout this time, granulocytosis without arrhythmia or the appearance of immature forms was maintained in the peripheral blood. At autopsy, the bone marrow showed definite myeloid hyperplasia but with no apparent damage to the integrity of the organ. Marked bilateral hypertrophy of the kidneys and splenomegaly were found in both rabbits. On microscopic examination, ectopic foci of myelocytes were seen scattered throughout both of these organs as evidence of the specificity of the stimulus for myeloid proliferation contained in the nucleinate molecule.[25]

Immediately on receiving our first consignment of nucleotide K-96 from Smith, Kline and French, we instituted a series of rabbit injections to test the toxicity and potency of this material in the light of our previous experimental studies. Previous to the injections and during the control period, bone marrow was removed from the proximal end of the tibia in each rabbit (fig. 1). For five days 0.35 Gm. was injected intravenously, daily or twice daily, without evidence of the slightest constitutional reaction on the part of the animals at any time. Temperatures and weights remained normal. Figure 2 is the tibial bone marrow from the side opposite that shown in figure 1 at the end of this period in rabbit 0-490. The myeloid hyperplasia is striking and represents the basis for the granulocytosis that was observed in the peripheral circulation.

Rabbit 87 was permitted to survive eight weeks. Figure 3 presents the blood changes during this time and shows the increase in granulocytes during the period of injection, with a gradual return to the preinjection level in the succeeding seven weeks. At autopsy there was some evidence of myeloid hyperplasia still remaining in the marrow of the long bones, but nothing else abnormal was revealed by microscopic study.

These rabbits received, in all, 3.7 Gm. of nucleotide K-96, which on the basis of relative weights would be the equivalent of from 300 to 450 Gm. in an adult weighing 150 pounds (68 Kg.). The average effective dosage of nucleotide K-96 in human cases of malignant neutropenia has been from 4 to 6 Gm. in our experience to date.

Thus the experimental studies on normal rabbits justify three conclusions: 1. Nucleic acid and its degradation products exert a chemotactic effect on normal

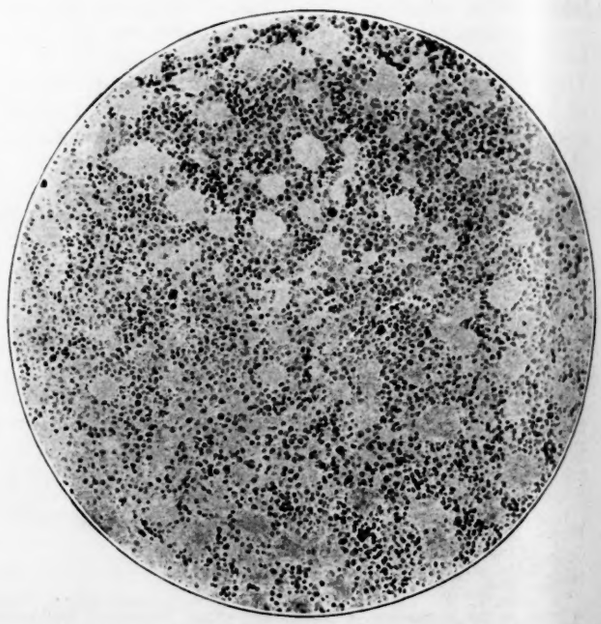

Fig. 2.—Marrow from the proximal end of the opposite tibia of rabbit 0-490, immediately following a series of five daily intravenous injections of nucleotide, of 0.35 Gm. each. The myeloid hyperplasia developed in the five-day interim at the expense of the original fat deposits; reduced from a photomicrograph with a magnification of 100 diameters.

myeloid foci with a prompt effective increase in the delivery of granular leukocytes to the peripheral circulation under a controlled physiologic or rhythmic mechanism. 2. Repeated large intravenous injections tend neither to exhaust nor to cause a malignant hyper-

25. Doan, C. A.: Nucleinate-Induced Extramedullary Myelopoiesis, Proc. Soc. Exper. Biol. & Med. **29**: 1030 (May) 1932.

plasia of the myeloid elements in normal animals. 3. A short course of injections stimulates a myeloid hyperplasia of normal marrow without otherwise injurious consequences, which is reflected by a relative and absolute increase in the amphophilic granulocytes in the blood stream of rabbits.

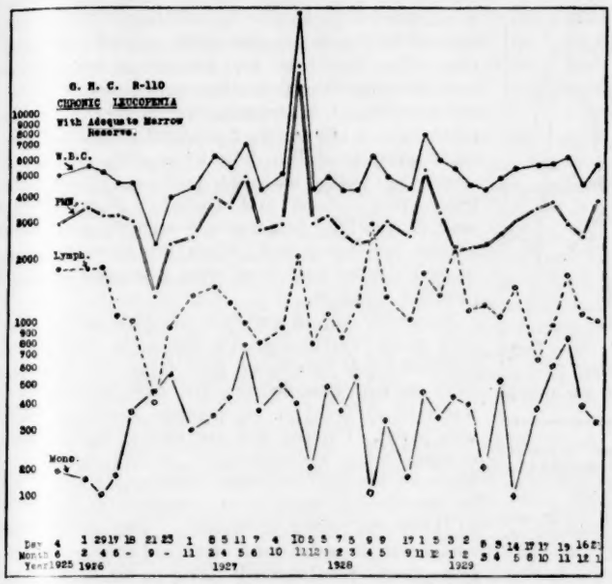

Fig. 4 (case 1).—Cellular response during five-year period of observation of G. H. C., a white man, aged 25, who had chronic leukopenia with adequate marrow reserve. An effective response when needed always occurred. Frequently the total white count was under 5,000.

CLINICAL STUDIES

Chronic Neutropenia.—As observed in the clinic, the idiopathic neutropenic state may be either acute or chronic. In those individuals presenting the more chronic condition, the symptoms are vague, and very few signs other than the leukopenia itself are present. The white cells may remain consistently well below 4,000, or there may be periodic fluctuations between a perfectly normal count and a more or less severe leukopenia.

It is important to differentiate further in this group of chronic leukopenic patients. In some, a count regularly totaling between 2,500 and 5,000 white blood cells does not seem to be incompatible with perfect health, and, whenever any intercurrent pyogenic infection intervenes, a leukocytosis develops promptly and no inadequacy in the response of the cellular defense forces of the body is apparent (fig. 4, case 1). Both quantitative and qualitative relationships within the white cells are normal, and the rhythm of delivery is normal. In such individuals, a perfectly satisfactory and efficient cellular equilibrium or homeostasis is established, except that it operates at a level somewhat below that found in the majority of normal adults. In this category of patients with an absolute decrease in neutrophils but showing a normal leukocytic response to infection may be placed those rare individuals who show a reversal of the neutrophil-eosinophil ratio in the blood; for during infection the eosinophils are replaced by a neutrophilic leukocytosis, proving that the eosinophil in such instances does not take over the function of the neutrophil.

In the second group of patients who show a chronic leukopenia of approximately similar grade, there is apt to be somewhat less of the normal feeling of well being. There is usually some loss of energy, an increased ease of fatigability, a relative lymphocytosis, and an absolute neutropenia with a mild "shift to the left" but no myelocytes present. In these patients any demand over and above that represented by the physiologic needs of the healthy body results in a more severe leukopenia rather than in a compensatory leukocytosis. Figure 5 (case 2) visualizes the blood changes in such an individual as followed over a forty-three day period. On March 13 the patient complained of sore throat and a severe headache and showed a fever of 102 F. His white blood count rose to 6,000 and the neutrophils, which had been ranging for the most part well under 2,000 per cubic millimeter, went to 3,600. The following day the patient's chief complaints were extreme weakness, prostration and fatigue. The granulocytes were found on four separate occasions throughout this day to be less than 200 per cubic millimeter. They numbered approximately 400 on the following day and reached the 1,000 per cubic millimeter level after another twenty-four hours in a spontaneous recovery. A few days later, 500 mg. of adenine sulphate in 20 cc. of sterile distilled water was injected slowly into the arm vein with a transitory response on the part of the granulocytes comparable to that previously observed in the presence of infection. When first seen, this patient was recovering spontaneously from a slight infection and the gradual trend upward of the neutrophils is seen at the left of the chart. In this patient any unusual stimulus or demand calls on a marrow with an exceedingly low reserve of myelocytes with which to respond; a relatively minor infection may thus precipitate a further state of lowered resistance and represents, therefore, a primary rather than a secondary factor in the production of the neutropenia. Such patients studied by the epinephrine test and by single injections of nucleotide present a bone marrow capable of definite but minimal responses with imminent possibilities of grave insufficiency. They have been advised to continue their normal activities but with instructions as to diet and general hygienic measures and have been warned to take unusual precautions when even minor pathologic conditions intervene. Such cases have been

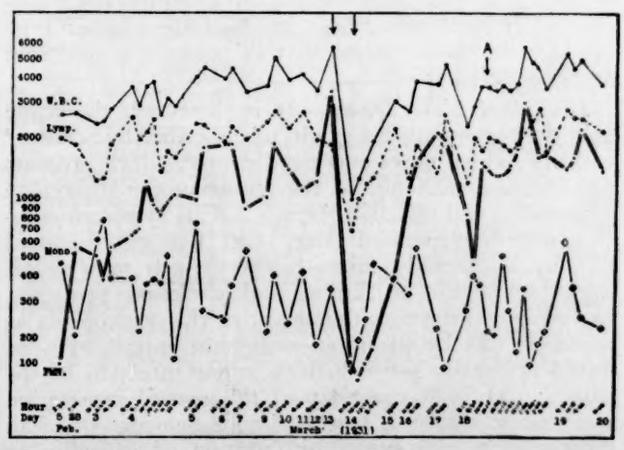

Fig. 5 (case 2).—Chronic neutropenia with low marrow reserve, in W. A. P., a white man, aged 32. Repeated tendency to marked neutropenia, checked by repeated determinations when found, following any unusual demand for granulocytes. Compare the marrow response to a natural infection (March 13) with marrow exhaustion following, and that observed after the intravenous injection of adenine sulphate (*A*, March 18) without evidence of marrow failure. In this type of case nucleotide may be useful in tiding the individual over his temporary insufficiencies.

followed during the past two years and have shown no tendency as yet to further progressive decompensation of the marrow.

Chronic regularly recurring periodic neutropenia associated with a cyclic alternation in certain aspects of the physical status presents still another problem. Figure 6 (case 3) records one segment of a study extending over more than a year in a woman, aged 18. There recurs in this patient on the average of every twenty to twenty-one days a relative and absolute neutropenia of severe grade, unaccompanied by the appearance of immature cells in the blood and uninfluenced by the administration of pentose nucleotides. The phenomenon is probably not of bone marrow origin. Certain similarities exist between this case and the only other recorded case in the medical literature at all comparable, that reported by Rutledge, Hansen and Thayer in 1930, though there are many dissimilarities. Further details of this case will be presented in a future communication. It will suffice here to illustrate another type of the neutropenic state—in this instance a recurrent neutropenic habitus.

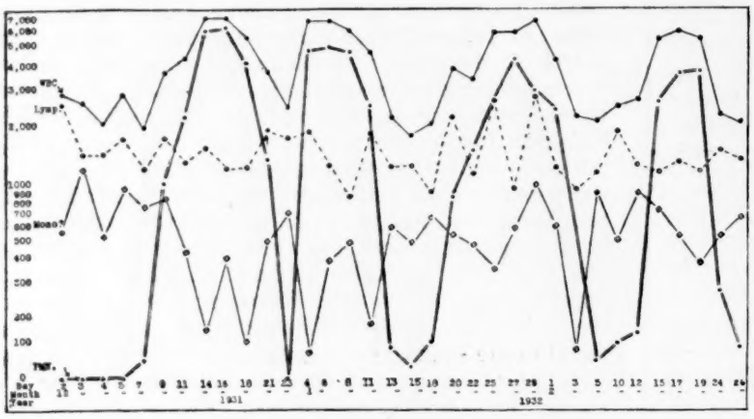

Fig. 6 (case 3).—Chronic recurring neutropenia in P. D., a white girl, aged 18 years: The low points in this rhythmic neutropenia recur regularly every twenty-one to twenty-three days. The tendency to monocytic compensation at these times is shown. This cycle is unassociated with the menstrual history. Certain relatively minor, nonincapacitating physical phenomena accompany these changes in the blood cells, which are not accompanied by the appearance of any immature forms and are not influenced by nucleotide injections.

Malignant Neutropenia.—It is, however, the acute condition, essentially the syndrome described by Schultz,[3] with its sudden onset and rapid course, which presents the dramatic challenge to the physician for immediate recognition and effective therapy. This symptom complex may be separated from other leukopenic states: (1) by a carefully taken history which may reveal vague symptoms of fatigue and weakness preceding any signs of infection, thus marking the neutropenia as primary; (2) by the rapid malignant spread of what would ordinarily prove to be a minor infection of the mouth; (3) by the severity of the general prostration and malaise and by a degree of apprehension out of all proportion to the extent or duration of infection or of the pathogenicity of the organisms found (Bacillus subtilis, Vincent's bacilli and spirilla, B. pyocyaneus); and (4) perhaps by the therapeutic test described hereafter.

As has been previously stated, the bone marrow may be either hyperplastic or relatively aplastic for myeloid elements in patients presenting in common the syndrome just described. The following case reports well illustrate these differences in pathologic changes in bone marrow which may underlie the neutropenia and which careful qualitative studies of the cells in the blood will reflect:

CASE 4.—W. W., a woman, aged 36, night supervisor of nurses at the University Hospital, had a tooth extracted, November 20. Three days later there developed generalized aching over the entire body with severe frontal and occipital headache. At the same time the patient noted a slight sore throat; on examination diffuse hyperemia, but no exudate or membrane, was found. There was marked local inflammation at the site of the extraction. The next day the patient showed marked general constitutional prostration, nausea, vomiting, slight epistaxis, a temperature of 101 F. and a pulse rate of 120 and was admitted to the hospital; there were no chills. The white count on admission was 1,500, with 22 per cent neutrophilic leukocytes. Blood and throat cultures yielded only B. subtilis. Interestingly enough, the patient a year previously had shown the same organism in pure culture associated with a severe throat and tonsillar infection.

November 27, 16 per cent of 2,000 white blood cells were neutrophils. On the 28th, with a total count of 1,400 leukocytes, only 2 per cent of which were normal granulocytes, the first intramuscular injection of 0.7 Gm. of pentose nucleotide K-96 was given. On the five succeeding days, similar dosages were administered. Within twenty-four hours of the first injection there was a sharp rise in the absolute number of granulocytes from 100 to 1,000 per cubic millimeter. During the two succeeding days the count remained at this approximate level, then started rising again, and maintained a steady gain until the high point of 11,000 total count with something over 6,000 polymorphonuclear leukocytes was reached on the thirty-second day after treatment was instituted.

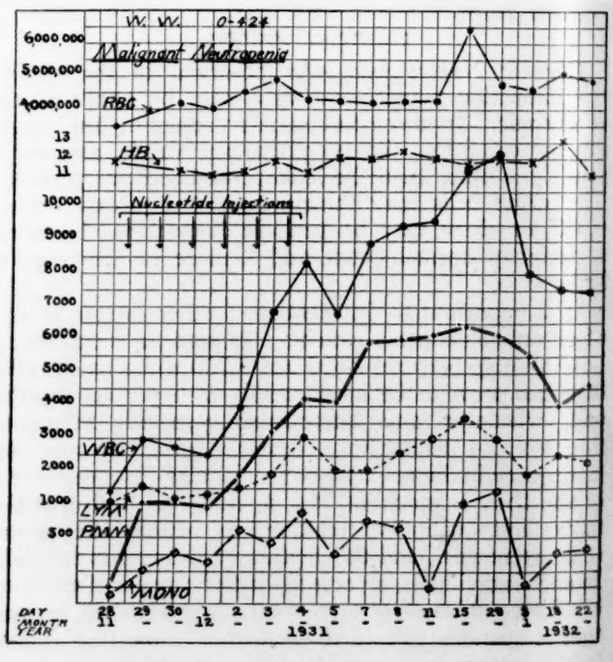

Fig. 7 (case 4).—The prompt rise in polymorphonuclear leukocytes beginning within twenty-four hours of the first injection of neucleotide is shown. An overcompensatory neutrophilia preceded the return to a normal level.

Thereafter the count returned to normal. The hemoglobin remained between 11 and 12 Gm. per hundred cubic centimeters of blood throughout and the erythrocytes between 4 and 5 million. The blood platelets were never deficient (from 150,000 to 400,000). The lymphocytes during the first six days were between 1,000 and 2,000 per cubic millimeter; thereafter between 2,000 and 3,500. The monocytes remained well within their limits of normal at all times. It will be seen from the graphic

representation of the blood examinations in this case in figure 7 that we were here dealing primarily with a leukopenia involving chiefly the neutrophils and that the recovery increases in neutrophils and total white cells paralleled each other strikingly. No immature myeloid cells earlier than the myelocyte C were encountered in any of the differential studies. Figure 8 represents the percentage of myelocytes charted against the total granulocytes, and figure 9 the Arneth differential count in somewhat more detail. Figure 10 records the temperature, pulse and respiration during the period of hospitalization. The study may be interpreted as reflecting the reestablishment of the normal delivery of granulocytes to the blood and tissues from a bone marrow which still contained many myeloid foci, even when the leukopenia was greatest in the peripheral blood.

CASE 5.[26]—H. B., a physician, aged 52, one week previous to entering the hospital and during a period of malaise and marked subjective fatigue developed gingivitis accompanied by severe pain. In the hope of possible relief, one lower incisor and one lower molar were extracted. Severe prostration and an increasingly severe gingivitis, especially marked about the extraction areas, immediately confined the patient to his home and bed. Fever fluctuated between 99 and 103 F. When seen by an otolaryngologist, a tentative diagnosis of acute leukemia was made because of the extent and character of the mouth lesions and the general appearance of the patient. Immediate removal to the hospital for differential diagnosis and treatment was ordered.

The first blood studies revealed: white blood cells, 1,000; red blood cells, 3,860,000; hemoglobin, 10.6 Gm. per hundred

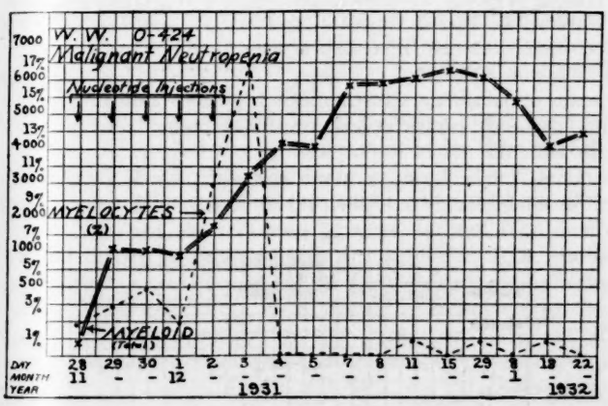

Fig. 8.—Malignant neutropenia in case 4: The renewed activity of the bone marrow is reflected in the transitory increase of myelocytes in the peripheral circulation quite as much as in the rising total count. The peak, 17 per cent, was reached on the fifth day after the first nucleotide injection. No cells younger than myelocyte C were encountered at any time in this patient.

cubic centimeters of blood; platelets, 90,000. The differential count revealed 4 per cent toxic granule neutrophils, 4 per cent myelocytes A, and 92 per cent lymphocytes. No monocytes were seen. No blood cultures made at this time or later during the illness showed any bacterial growth. One ampule of pentose nucleotide K-96 (0.7 Gm.) was immediately administered intramuscularly. The course of the recovery is revealed in the studies of the cells of the blood. Twenty-four hours following the first nucleotide injection there was definite improvement in the subjective reaction of the patient. The extreme apprehension was subsiding; he was resting better, was sleeping fitfully, and afterward described his sensations at this time as of the resumption of internal physiologic activities which had seemed temporarily suspended. Because of the severity of the clinical condition, 1.4 Gm. of nucleotide in two divided doses was given daily during the first seventy-two hours following admission to the hospital. A sharp but small rise in the granulocytes occurred promptly (fig. 11), from 100 to 500 cells per cubic millimeter. For the succeeding five days the myeloid cells mounted gradually from 500 to 1,000 per cubic millimeter,

26. This patient was studied and treated in cooperation with Drs. J. J. Coons, J. H. Warren and C. H. Hoffhine. I am also indebted to Mr. H. C. Johnson for assistance in securing some of the blood samples.

an almost imperceptible increment but important in that there was no actual loss of ground on any day, and the qualitative changes to be mentioned later were of reassuring prognostic significance in these days of the beginning recovery. Even though the total count and granulocyte level per se were far from satisfactory at the end of the sixth day of nucleotide treatment, other considerations made it seem safe and advisable to suspend injections and to resume treatment only if the

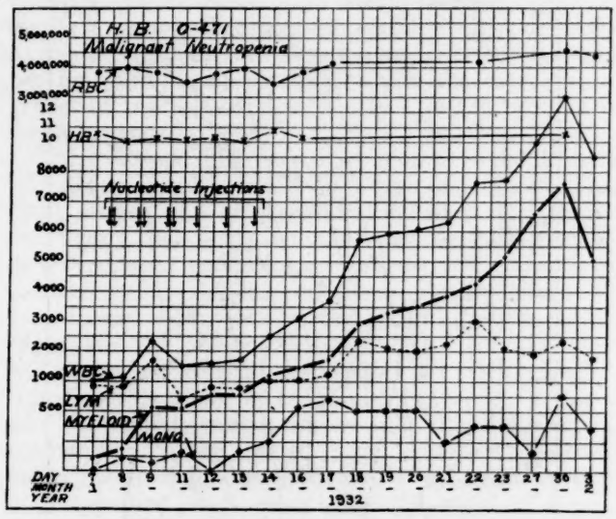

Fig. 11 (case 5).—Within forty-eight hours of the first nucleotide injection, a slight but definite gain in the neutrophilic cells was noted. A gradual but steady recovery ensued; no relapse has occurred during the past five months.

favorable trend of events should cease abruptly, which did not happen. Objective as well as subjective clinical improvement continued uninterruptedly to complete recovery during the succeeding days and weeks.

Figure 12 has been constructed on a percentage scale to visualize the changing proportional relationships of granulocytes, lymphocytes and monocytes during the course of the disease. From a predominance of 92 per cent lymphocytes, with only 8 per cent myeloid cells on January 7, a gradual

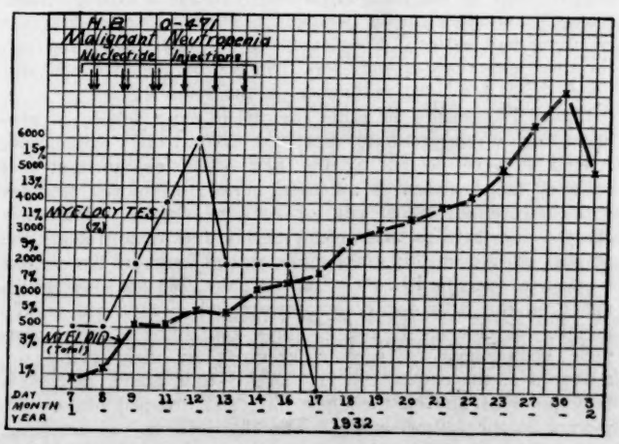

Fig. 13 (case 5).—Coincident with the first increase in total neutrophils, and reflecting even more reassuringly a reawakening of marrow activity, was the percentage increase in early myelocytic forms. With 8 per cent at forty-eight hours following the first nucleotide injection, the high point of 16 per cent was reached on the fifth day, myelocytes being present in the circulation until the tenth day following the institution of treatment. The chart was made from supravital data.

resumption of the normal 75:21:4 ratio of February 3 was observed.

It has been mentioned that certain qualitative studies of the myeloid cells during the period of recovery foretold the course of events more promptly than did either the absolute or the percentage increase in granulocytes. Figures 13 and 14 visualize these data.

The first (fig. 13) shows the varying percentage of immature myelocytes of all ages, charted against the total number of myeloid elements. The result strongly suggests the now familiar curve of reticulocytes and total erythrocytes indicative of bone marrow response to liver or iron therapy in the anemias, even to the plateau in the middle of the descent from the high point for young cells. It will be noted that the peak

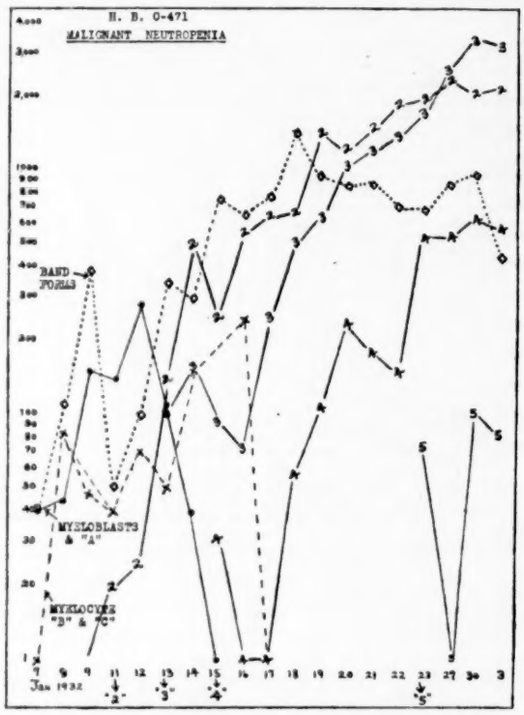

Fig. 14 (case 5).—The sequence of events as the earliest cells of the myeloid series appear, only to be supplanted each in turn by succeeding generations of more mature cells unfolds the life cycle of the neutrophilic myelocyte and leukocyte quite as completely as it is revealed in histologic studies of regenerating bone marrow. The data were taken from both supravital and fixed film differentials.

(16 per cent) of new young myeloid cells in the circulation was reached on the fifth day after treatment was begun, and that all immature forms younger than the "band form" of Schilling had entirely disappeared by the tenth day; and yet, the total granulocytes were less than 800 on the fifth and still under 1,500 per cubic millimeter on the tenth day.

Figure 14 presents the same analysis in more detail. Myeloblasts or myelocytes A, identified largely by cytoplasmic criteria,[27] were present at the first blood examination and reflected the depletion of the more mature myelocytic reserves with a resultant hypoplasia of extreme degree. They are charted together, as are myelocytes B and C to reduce the number of lines in this graph. The myeloblasts and the earliest myelocytes increased to their highest point, 280 per cubic millimeter on the fifth day of treatment, and disappeared on the eighth. Myelocytes B and C, those containing a more complete complement of specific granules in their cytoplasm, appeared at the end of the first twenty-four hours, reached a high point of 250 on the ninth day, and dropped out of the picture on the following day. The "band forms" of Schilling, the earliest of the motile granulocytes, as evidenced both by the nonsegmented nucleus and by the heavier myelocytic staining of the specific granules, were present to the number of 40 per cubic millimeter on the first examination. They were present in all preparations at all times but reached the maximum (1,400) on the eleventh day and thereafter gradually decreased to resume their proper proportionate representation in the count as equilibrium was again established. The first granulocyte with a segmented nucleus, two lobes, was not observed in the circulation until the fourth day, but thereafter these two-lobed neutrophils increased rapidly until the twentieth day, when for the first time those cells with three lobes surpassed them in total number. These slightly older granulocytes, as judged by the lobing of their nuclei, had appeared for the first time on the sixth day; one cell with four lobes to the nucleus was seen in one preparation two days thereafter, but not until the eleventh day had they come to stay. Five days later, on the sixteenth day after treatment was begun, granulocytes showing five nuclear segments appeared, at which time there were something over 5,000 granulocytes per cubic millimeter in the peripheral circulation and the patient was well along on his way to convalescence (fig. 15). Thus, the story of the origin, maturation and delivery of the neutrophilic leukocytes from myeloblast through the various myelocytic stages in bone marrow to the fully mature, motile, functionally efficient definitive unit of the circulation has been followed and the time relationships for each stage established, at least for this individual under the circumstances of his particular heredity and environment. From myeloblast to five-lobed polymorphonuclear leukocyte probably requires approximately two weeks' time according to the deductions from this particular case. When the bone marrow is thrown back to the myeloblastic level or still further, it is quite as possible to follow from the cells in the peripheral circulation the various steps in its regenerative response toward the resumption of normal function as in the case of megaloblastic or erythroblastic marrow. In this instance, whether specifically the result of nucleotide stimulation or as a coincidental spontaneous regeneration, I feel confident that because of the slowness of the return to a normal total count and the character of the early cellular response we were dealing with a relatively hypoplastic marrow as far as myeloid foci were concerned and that recovery occurred from such a state.

CASE 6.—M. H., a woman, aged 25, having malignant neutropenia similar in symptomatology and clinical course to the cases already described, responded promptly to nucleotide therapy with complete recovery.

CASE 7.—J. A. Z., a physician's wife, aged 33, was seen with an acute otitis media, but with general prostration and

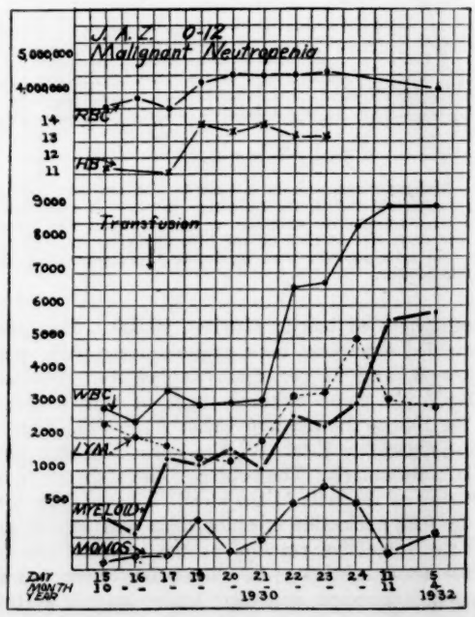

Fig. 16.—Malignant neutropenia in case 7: The transfusion of 500 cc. of whole blood initiated a train of events in this patient strikingly similar to those previously recorded following nucleotide therapy.

malaise out of all proportion to the localized nature of the infection. Nine months previously she had had a similar infection of the middle ear with a low total white count. Recovery was spontaneous after local treatment of the otitis. When seen at the present illness, a recurrence of the neutropenic condition was suspected and verified. The total leukocyte count was between 2,500 and 2,800, with the majority of the cells lympho-

27. Sabin, F. R.; Austrian, C. R.; Cunningham, R. S., and Doan, C. A.: Studies in Subacute Myeloblastic Leukemia, J. Exper. Med. 40: 845 (Dec.) 1924.

cytes (fig. 16). Less than 500 granulocytes were found, but those which were present were mature forms. Monocytes and lymphocytes were present in normal numbers. Red blood cells, hemoglobin and blood platelets were not remarkable. The normal lymphocytes and the presence of mature leukocytes were good prognostic signs, and the latter suggested that there were myeloid foci still remaining in the bone marrow but for some reason the cells were not maturing and being delivered as needed. Blood transfusion was advised, no nucleotide being available at the moment. The similarity of the sharp rise in granulocytes twenty-four hours following the direct transfusion of 500 cc. of blood to that observed in the two preceding cases following the institution of nucleotide therapy suggests a similar effect on the myeloid mechanism in the bone marrow (fig. 17). Following the small but definite initial recovery of neutrophils, the total number of granulocytes remained slightly above 1,000 per cubic millimeter for the next three days, when a new level around 2,500 was attained and thereafter convalescence proceeded without complications. There has been no recurrence of the condition during the past eighteen months up to the present writing.

COMMENT

Many therapeutic measures have been suggested and tried in an attempt to prevent the rapidly fatal termination that has attended and threatens to attend the individual deprived for any appreciable length of time of his chief cellular defense mechanism, the neutrophilic leukocyte. Because of the obscure etiology and widely varying basic pathology in the group of cases presenting this syndrome, empiricism rather than therapeutic rationale has governed in most of the suggested treatments. The majority of the measures instituted have apparently been of little curative value.

The three measures that have seemed to give the best promise as judged by clinical reports are irradiation, blood transfusion or some form of nucleic acid. This being true, it is reasonable to inquire into the possible explanation for the reported benefits derived from such widely divergent therapeutic procedures. Are spontaneous recoveries being confused with supposed therapeutic victories? The high mortality reported in the untreated cases presenting the symptom complex of malignant neutropenia and the occurrence of such fatal cases in this community during the period covered by the present studies speaks against a frequent spontaneous recovery, though doubtless such recoveries do occur. If, then, these measures really help, how does each one work to accomplish the ultimate therapeutic ideal of physiologic specificity?

The reasoning based on experimental and clinical data by which the degradation products of senile and disintegrating cells are seen as an integral part of the normal mechanism for maintaining cellular equilibrium has been presented in the earlier part of this paper. Theoretically, at least, therefore, in those cases presenting an etiology essentially intrinsic and related to an insufficiency of the myelopoietic function of bone marrow, the more rational treatment should be the supplying to the body of a concentrated preparation of the active principle affecting directly the myeloid centers. One should expect a higher percentage of recoveries in properly diagnosed cases from this therapy than from less direct measures, as shown in the accompanying table. There would seem to be no rationale for the use of the nucleotides in leukemia [28] on the basis of present experimental knowledge.

In the normal individual these nucleotide products are present in minimal quantities in the circulating blood.[20] In addition, the neutrophilic leukocytes which are in the circulation will yield nucleic acid on disintegration. Thus, when the blood from a normal donor is transfused into a recipient with peripheral neutropenia but with a fairly normal myelocytic content in the marrow, it frequently must carry a sufficient additional increment of the active principle to restore the normal mechanism of cell delivery once again. In such instances blood transfusion really initiates recovery and is a rational therapeutic procedure. Its one drawback is the small concentration of effective stimulus per unit volume of blood, which in the more severe grades of myeloid hypoplasia may prove insufficient in the emergency.

There is some difference of opinion as to the primary effect of minimal exposure to x-rays or radium. That many tissues and especially the hematopoietic tissues are highly radiosensitive and may be inadvertently destroyed by a variable exposure to such active rays, particularly in individuals of a more readily susceptible constitution, makes of this therapeutic measure a two edged sword to be wielded with great caution when stimulation rather than destruction is the end desired. Granting that there is a stimulatory threshold below which a primary destruction of cells does not precede regeneration,[29] this must vary considerably from individual to individual and hardly yet be susceptible of recognition and control by the roentgenologist, especially when tissue within the bony confines of the skeleton is to be affected. In patients with malignant neutropenia but in whom the marrow is hyperplastic and shows only a maturation arrest, the mechanism by which a response is obtained may well be that of a primary destruction of some of the intact myeloid foci with a liberation of autogenous nucleotide, which then could initiate the maturation and delivery of leukocytes from the remaining myeloid foci. The fact that a number of the cases treated by repeated 1/20 erythema doses of x-rays over the long bones have shown a prompt response in the peripheral blood only to be quickly followed by a relapse which proved rapidly fatal in the face of all therapy, including a second series of x-ray treatments,[30] seems to illustrate the effect of a potentially destructive agent when a marked grade of myeloid hypoplasia exists as a basis for the neutropenia. A complete aplasia may be precipitated under such circumstances. On the other hand, the explanation for the fatal recurrence in such cases may be simply the development of a complete decompensation of the organ following the last heroic effort to respond to stimuli ordinarily effective in initiating and maintaining myelopoiesis. Thus, it may well be that a common mechanism is invoked by each of the three therapeutic measures mentioned when recoveries follow their use, even though at first glance they appear to be dissimilar.

Mortality Statistics of Malignant Neutropenia

Therapy	Cases	Deaths	Mortality, per Cent
Untreated	Many	..	90+
Miscellaneous therapeutic measures	178	133	74
Arsphenamine	33	24	72
Blood transfusion	53	34	64
Irradiation	64	34	53
Nucleotide	44	11	25

28. Jackson, Henry, Jr.; Parker, Frederic, Jr.; Robb, G. P., and Curtis, Helen: A Case of Acute Leukemia with a Five-Months' Remission, Folia haemat. **44**: 30 (April) 1931.

29. Nakahara, W.: Changes in the Lymphoid Organs After Small Doses of X-Rays, J. Exper. Med. **29**: 83 (Jan.) 1919.

30. Taussig, A. E., and Schnoebelen, P. C.: Roentgen Treatment of Agranulocytosis, J. A. M. A. **97**: 1757 (Dec. 12) 1931.

It is obviously premature to attempt any final statistical appraisal of the relative merits of the respective therapeutic measures under discussion. However, taking the summary of figures published in December, 1931, by Taussig and Schnoebelen [30] and adding thereto the series of patients thus far treated with nucleotide by Reznikoff,[22] Jackson [31] and associates, and myself, the relative proportion of successes to date shown in the table, is suggestive in supporting the hypothesis here advanced as to the mechanism that may underlie the action of each. If nucleotide is a specific stimulus to myelopoiesis, then when such stimulation is either lacking in the body or insufficient because of other destructive forces the most effective therapeutic rationale should include its attempted replacement in concentrated form.

In addition to the measures directed toward the stimulation of a waning or failing granulopoietic bone marrow, too much emphasis cannot be placed on the special attention which should be given to any foci of infection that may be present. The mouth and throat are more usually affected, when the neutrophilic leukocytes become so few in number as to permit the multiplication of the fusiform bacilli and spirilla of Vincent's and the invasion of the mucous membranes by the ordinary bacterial flora of this region. Meticulous care several times each day in the local treatment of these oropharyngeal lesions by a competent specialist reduces the dangers of blood stream invasion during this period of low resistance. Apical abscess, otitis media, rectal abscess and infected sinuses have made up a part of the syndrome in some of these cases and, whenever present, each of these complicating conditions should be considered with more than the usual care and all available local measures to limit their activity, and progressive development should be vigorously prosecuted.

CONCLUSIONS

1. The neutropenic state may be chronic or acute, constant, recurrent or nonrecurrent. In diagnosis it must be sharply differentiated from the leukopenia associated with many other clinical syndromes.

2. The chronic condition of moderate leukopenia may either mean a normal physiologic equilibrium maintained at a level somewhat lower than the average, with no detectable influence on the normal health of the individual, or it may reflect a low myelocytic reserve in the marrow with constant potential danger of marrow insufficiency and decompensation.

3. The acute or malignant neutropenic state presents a crisis that is rapidly fatal if recovery of marrow function is not initiated promptly. The underlying pathologic condition may include myeloid hypoplasia or hyperplasia.

4. Experimental and clinical observations form the basis for attributing to nucleic acid and to the nucleotides chemotactic, maturative and initiatory stimuli for neutrophilic myelocytes when the basic mesenchymal tissues from which they arise are in a condition to respond.

5. Blood transfusion and irradiation may act through the same nucleotide mechanism, when effective. The latter, because of its potentially destructive affinity for hematopoietic tissues, must be used with great caution when stimulation is desired. Further experimental studies are needed to ascertain whether the x-rays may be really primarily stimulatory to myeloid tissue without a preceding destructive phase.

31. Jackson, Henry, Jr.: Personal communication to the author.

CHRONIC SEVERE ASTHMA

A STUDY OF A GROUP OF CASES REQUIRING HOSPITAL TREATMENT

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In 1930 and 1931, 132 patients were admitted to the Massachusetts General Hospital because their asthma was severe enough to demand treatment in the wards. They were all difficult cases. Among these patients was a group of twenty-five patients with chronic severe asthma peculiarly resistant to treatment, on whom several observations have been made. Before discussing these cases, however, it is necessary to show the relation of this group to the other types of asthma.

Clinical Characteristics in One Hundred and Thirty-Two Asthma Cases in the Hospital

		Number of Cases	Average Age		Criteria of Allergy (Percentage of Incidence)				Relieved in Hospital
			Onset	Present	Family History	Other Allergy	Skin Test	Eosinophilia	
Extrinsic		46	19	32	67	83	75	65	44
Intrinsic	Attacks	17	32	39	55	14	20	46	7
	Severe	25	38	45	80	66	26	73	0
	Emphysema	13	41	54	0	75	25	40	3
	Cardiac	19	55	59	71	66	38	40	4
Miscellaneous		12	25	36	50	33	58	66	3
Total		132	30	42	65	69	52	57	61

The accompanying table shows the clinical characteristics of all the patients and the groups into which they fall. Extrinsic asthma was a diagnosis made in forty-six patients, or 35 per cent of the 132, chiefly because the history included the story of changes in the symptoms corresponding to changes in the environment or diet. The diagnosis was confirmed by the prompt relief in the hospital, where all but two of these patients were relieved of their asthma within five days, evidently because they had escaped from some particular substance, a dust or a food, which was causing trouble at home.

The intrinsic cases formed a larger group of seventy-four cases (56 per cent), which can be readily subdivided. In seventeen of these, the asthma had occurred in isolated attacks, of longer or shorter duration, which were usually precipitated by head colds. Between these attacks, the patients were essentially normal. Of the seventeen cases, seven were relieved within five days in the hospital. The others improved more slowly.

The chronic severe group will be discussed presently.

Thirteen patients had typical emphysema with a barrel-shaped chest over which the expiration was prolonged and high pitched. Some had cyanosis. All had dyspnea on any exertion and most of them had cough. In these cases, the emphysema was the result of long standing asthma which was complicated by secondary bronchial infection. It may be said parenthetically that other patients with little or no bronchial infection who were relieved of long standing extrinsic asthma by the elimination of the specific cause have shown, on later reexamination, chest outlines and lung signs which were normal. Apparently, therefore, emphysema can develop only in the presence of secondary infection.

Read before the Association of American Physicians at Atlantic City, N. J., May 4, 1932.

Included in the emphysema group were four old men whose symptoms first began in the late fifties, coming on without apparent cause insidiously. A blood eosinophilia was found in two, but skin tests were negative in all. In these men, the facts suggest a "primary" rather than a "secondary" emphysema.

The diagnosis of cardiac asthma was made in eighteen patients (1.3 per cent of the whole) and based on two principal points: First, the age of onset was usually beyond 50, and the duration of the disease was short. Second, the original attack was violent and occurred often during exertion or excitement, perhaps on the street or at work, and the later attacks were likewise precipitated by exertion. Half of these patients had well marked hypertension and few others had evidence of heart damage, as shown by pulse irregularities and electrocardiographic changes. By and large, however, the clinical evidence of decompensation was wanting and the diagnosis rested chiefly on the age and nature of the onset and on the history.

A miscellaneous group is necessary, because mixed cases showing factors that would place them in two groups at the same time are common. Mixed cases are always difficult.

The chronic severe group, however, forms the theme of this paper. It consists of twenty-five patients (19 per cent of the whole number) whose asthma was of maximum severity and was relieved only partially by ordinary treatment. In most of them, asthma developed between the ages of 30 and 50, the average age of onset being 38. Men and women were about equal in the group. The table shows that these patients had much in common with the other groups. Thus, the figure showing the percentage incidence of a positive family history is high. The occurrence of other allergic manifestations is the same as in other groups. Positive skin tests were found in 26 per cent of the cases. The occurrence of a blood eosinophilia of 5 per cent or more in 73 per cent is interesting.

In the hospital, none of these patients did well, although perhaps half of them improved a little during their stay. In each case, epinephrine was necessary at frequent intervals to control their symptoms.

The mode of onset of the asthma in this severe group is important and interesting. In five cases, the early story was of a series of isolated attacks, beginning in early life, even in childhood. In them, it is proper to regard the development of chronic severe asthma as an end stage of the early infection. In twenty cases, however, the onset was comparatively recent and sudden, and the course steady and progressive. In twelve of the twenty cases, this onset was after an acute infection of the respiratory tract. In eight cases, the onset of asthma was associated with operations on the nose, performed for the relief of chronic nasal symptoms. It was the operation itself that seemed to precipitate the severe asthma, which persisted and was uninfluenced by further local treatment, often radical in character. The development of severe asthma after nasal surgery is interesting. The sequence of events suggests either a sort of reflex effect or that the operation served merely to stir up the focus and lead to the development of an allergic reaction to it.

So far, the classification of chronic severe asthma has depended solely on the history of severe and continuous asthma, not modified appreciably by changes in environment. The size of this group will vary with the kind of cases studied. In this paper, I am dealing only with hospital cases, and 19 per cent are included in the chronic severe group. In 1928,[1] another series included asthmatic patients of every kind, and the designation of chronic severe asthma was made in only 2 per cent of the cases.

A study of the chronic severe group suggests a number of questions about asthma.

1. Is all asthma of extrinsic origin? Does every case depend on a hypersensitiveness to some nonbacterial substance? The question is not easily ruled out. Head colds precipitate asthma, to be sure, but they are not always the primary cause. Under certain conditions, some patients can have a head cold without having asthma; under other conditions, colds make a slight degree of exposure to the specific foreign substance effective, and these patients have asthma.

In the cases under consideration, all foods and dusts for which positive skin tests were obtained were eliminated at once. In addition, efforts to eliminate gross sources of dust have been made. Four of the patients were confined for more than seven days in a room made partially dust free with a rubber mattress and pillow and with air filtered through lamb's wool. Only one of them improved enough to suggest the escape from an extrinsic factor. In other cases, diets were advised even though skin tests to foods were entirely negative, but little change followed the empirical exclusion of eggs, wheat and milk, and in a few cases the elimination diets suggested by Rowe [2] were carried out with care but without success. I feel confident, therefore, that the influence of specific dusts and foods can be excluded and, as a corollary, that infections play the chief rôle in these cases.

2. Can severe asthma be of psychic origin? The possibility is hard to exclude. It is quite true that in a majority of our patients there were domestic incompatibilities, financial troubles, or some similar source of anxiety which might well have served as a psychopathic background. Elaborate psychic analyses have not been attempted, but in one or two instances a quiet effort to distract attention from the attack or to encourage breathing of a more even and efficient type has helped. The patient and the result have suggested that "nerves" were important. On the other hand, organic lesions were present. A blood eosinophilia of 5 per cent or more was found in 72 per cent of the patients in this group, and almost all had evidence of focal infection, as will be discussed presently. Furthermore, it appears to me as obvious that asthma which is chronic and severe can produce not only "nerves" in the patient but unhappiness and financial difficulties in the home. The contemplation of "nervous" asthma as a primary factor is dangerous.

3. What is the rôle of chronic infections? In times past it has been stated that lesions in the nose and throat could often be regarded as a part of the asthma rather than a cause of it.[3] The reason for this statement was that such lesions as thickened membranes and cloudy sinuses as shown by x-rays, as well as nasal polypi, were common in asthma of all types, including that type in which the asthma depended on a known extrinsic cause. Furthermore, among the 213 cases formerly described [4] in which there was relief of asthma for over two years, nasal polypi and advanced sinusitis

1. Rackemann, F. M.: Studies in Asthma: I. A Clinical Survey of 1,074 Patients with Asthma Followed for Two Years, J. Lab. & Clin. Med. **12**: 1185 (Sept.) 1927.
2. Rowe, A. H.: Food Allergy: Its Manifestations, Diagnosis and Treatment, J. A. M. A. **91**: 1623 (Nov. 24) 1928.
3. Rackemann, F. M., and Tobey, H. G.: Studies in Asthma: IV. The Nose and Throat in Asthma, Arch. Otolaryng. **9**: 612 (June) 1929.
4. Rackemann, F. M.: Studies in Asthma: II. An Analysis of Two Hundred and Thirteen Cases in Which the Patients Were Relieved for More Than Two Years, Arch. Int. Med. **41**: 346 (March) 1928.

were found in thirty-one instances, and, nevertheless, apparent recovery had ensued without any operation being performed.

In the present group of twenty-five chronic severe cases, evidence of chronic infection in the nasal sinuses was found in all but two, and in twelve cases in which nasal polypi had been removed in the past or were present now, a diagnosis of pansinusitis was made. All the cases except two showed the presence of thick membrane in the sinus roentgenograms. In the other groups, lesions in the sinuses were found in a few cases. They were sometimes of equal severity, but in many cases they were not seen at all.

Operations had been performed previously in seven of our twenty-five cases, and four more were operated on while under observation; but in none of the eleven cases was anything more than a transient benefit obtained. While the literature contains reports of many patients relieved of their asthma by nose and throat operations, the proportions of these good results in severe cases is probably very small.

That the peribronchial shadows in the roentgenograms represent a focus of infection in the bronchi or in the neighboring lymph nodes is a possibility which cannot be excluded. One cannot say, however, that the shadows in the chronic severe cases were different in quantity or quality from the shadows in other cases.

Methods of treatment have included bronchoscopy. While bronchoscopy has been performed on only one of this particular group of patients and then without great relief, Dr. Weille [5] in our clinic has studied other patients with severe asthma and has frequently found a definite accumulation of tenacious sticky exudate in the bronchi. In eleven out of fifteen cases, the removal of this material by suction brought relief to the asthma which lasted for several weeks and, in three instances, for over a year. The method deserves a further trial.

The possibility of interrupting the nerve pathways over which the impulses from a local process might travel to and from the lungs has been considered. Having demonstrated transient relief to the asthma by a paravertebral injection of procaine hydrochloride, Dr. James C. White has been good enough to remove the parasympathetic ganglions in two of our cases. One of them (N. K.) a woman, aged 46, thin and emaciated from long continued distressing asthma showed no change during the first month after operation but then improved, and now, two years later, she has gained 40 pounds (18 Kg.) and is almost free from asthma. The control for this first experiment, however, has ruled its importance out. Another woman (C. H.), whose history and experiences were very similar, and who was observed in about the same month and year, was not operated on and yet she also has gained 40 pounds and has likewise become almost free from asthma for reasons quite unknown. The second patient (S. T., a man) likewise failed to gain in the first month after operation but now, four months later, is improving a little.

Nonspecific treatment in the form of intravenous typhoid vaccine has been tried in seven cases and was repeated in two of them. The benefit, however, was slight and temporary, never permanent.

COMMENT

This account of twenty-five severe cases is discouraging. Fortunately, however, asthma of such severe character is not common. Only a few patients have asthma which is bad enough to require hospital treatment, and the accompanying table shows that nearly half of all these are relieved of their symptoms within five days after admission. Only about one in five of the hospital patients has asthma that is chronic and severe.

What causes the trouble in these severe cases? The problem is difficult and the approach has been limited and unsatisfactory. So far one can only speculate.

Extrinsic factors can be excluded. Psychic factors are of secondary rather than primary interest. Focal infections are probably important.

The table shows that the incidence of a positive family history, of "other allergy," of positive skin tests, and of eosinophilia in the group is comparable to the incidence of these factors in the other groups, and this suggests a common background for all the groups.

Allergy is the capacity to develop sensitiveness to foreign substances, the list of which is ordinarily restricted to those present in foods and dusts of all kinds, especially pollens and animal danders. I can see no reason for this restriction and believe that cases depend on two principal factors: The one is the presence of a chronic infection; the other is the abnormal (allergic) reaction of the host to this infection. The physiologic nature of this reaction remains to be determined. In the understanding of it lies the key to the treatment of asthma.

263 Beacon Street.

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SERUM THERAPY

ITS VALUE IN PNEUMONIA, MENINGITIS, SCARLET FEVER AND OTHER STREPTOCOCCUS INFECTIONS

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The bacterial incitants of infectious disease vary greatly in virulence, in their parasitic adaptation to the tissues of an animal, in the potency of the toxins that they produce and in their immunizing action. It is these capacities that determine not only the character, extent and course of the disease, but also the potency, valence and quality of the therapeutic serums that are prepared from them. From the beginning, the quality of the antipneumococcus, antimeningococcus and antistreptococcus serums that have been generally available has varied greatly.

ANTIPNEUMOCOCCUS SERUM

At first antipneumococcus serum was thought to have an action similar to that of diphtheria antitoxin. Certainly pneumonia presents sufficiently convincing evidence of the toxemia and of the neutralization of the toxin during the crisis, although ultimate recovery depends on the extent and severity of the bacteremia. Practical results with serum therapy have been attained only in the treatment of type I pneumonia; not that antipneumococcus serum of other types is not or may not become effective, but that it is still in the experimental stage.

This limitation adds, perhaps, to the importance of the incidence of the different types of infection. Reports on the type diagnosis of pneumonia have been received from many of the states and from foreign

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countries. Although the number of cases in some districts is too limited to be of significance, yet the series that we have been able to tabulate is of special interest since the tests were all made with our diagnostic serums. An indeterminate but negligible number of the tests outside New York State were made in cases in which the patients did not have pneumonia.

Although knowledge of the virulence of the pneumococcus has progressed, there are yet no definite criteria by which to evaluate differences in toxicity or antigenicity which would form a scientific basis for the selection of strains for serum production. Furthermore, the standardization of the serum has been limited to the protection test. The practical value of the refined globulins has not been demonstrated beyond question. The clinical reports on their use do not indicate any better results than have been obtained with serum. The practice of concentrating serum of low potency is commercially profitable, but there is no practical advantage unless these methods are used solely to improve the quality of serums of the highest potency attainable. When such highly potent serums have been subjected to special methods of concentration, refined products have been obtained which, according to improved methods of testing, surpass any of the serums we have tested, but there are as yet no clinical data to indicate that they are actually therapeutically more effective than serum of the highest potency.

TABLE 1.—*Type Incidence of Pneumococci, 1915-1931*

Locality	Total	Type I		Type II		Type II* Atypical		Type III		Type IV		Combined*	
		Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
New York State	22,324	4,381	20	2,248	10	200	1	3,696	16	11,533	52	266	1
United States exclusive of New York State	6,418	1,279	20	943	15	...	...	876	13	3,320	52	...	...
Canada	557	106	19	69	12	...	...	56	11	326	58	...	...
Europe	1,353	423	31	240	18	...	...	229	17	461	34	...	...
Far East	584	210	36	67	12	...	...	36	6	271	46	...	...

* The determination of atypical type II and combined types has been reported by so few laboratories outside New York State that the figures lack significance and have been omitted.

TABLE 2.—*Potency of Antipneumococcus Serums from Different Laboratories as Determined by Protection Tests in Mice, 1932*

Laboratory	Therapeutic Dose, Cc.	Amount Protecting Against 0.1 Cc. of Standard Culture	
		Standard Control Serum, Cc.	Tested Serums (Concentrated), Cc.
A	10	0.01	0.01
D	5	0.01	(approx.) 0.01
E	50	0.01	+0.1 *
	10	0.01	(approx.) 0.01
F	8	0.01	0.005
H	..†	0.01	(approx.) 0.005
	50	0.01	0.01‡

* Special preparation.
† Not for distribution.
‡ Unconcentrated.

Reports have been received on 853 cases of type I pneumonia, including two separate series totaling 191 from Dr. Rufus Cole of the Hospital of the Rockefeller Institute, the mortality of which was 10.9 per cent. A more detailed study of 445 of these cases has been reported.[1] With the additional cases, the total mortality is 12.4 per cent. Thus, with the elimination of cases in which the patients were unsatisfactorily treated, the mortality approaches that at the Rockefeller Hospital. The serum is the same as that used by Dr. Cole in his recent work. The earlier serums were not identical, but quite similar. A comparable series of 362 cases in which the patients were not treated had a mortality of 19.8 per cent, which approximates the mortality of pneumonia in general—all cases, 20 per cent.

The limitations of serum therapy have thus been defined by practical experience. The selection of more effective strains for the immunization of the horses, the development of new methods of immunization and, finally, improved methods of concentration at present offer the only promise of future progress.

ANTIMENINGOCOCCUS SERUM

Knowledge of the virulence and pathogenicity of the meningococcus unfortunately is extremely limited. The experimental study of infection is hampered by the lack of laboratory animals that are susceptible to true infection and the difficulty of differentiating the toxic products. The mortality of endemic and of epidemic cases at different stages of an outbreak indicates marked fluctuation either in the virulence of the incitant or in the susceptibility of the host. The high mortality of the early cases in an outbreak suggests rapid and marked exaltation of the virulence, doubtless in part due to rapid passage from one extremely susceptible host to another, while the relatively low mortality of later cases may be attributed to the abatement of virulence in slower passage and a diminution in the number of susceptible hosts.

Unsuccessful attempts have been made to identify a particular strain with the epidemics of high mortality, which have occurred recently in Salt Lake City, Chicago, Indianapolis, Detroit and elsewhere. Representatives of more than one group, chiefly I and III, have been found in these outbreaks, and no special significance has been attributed to any one strain.

A previous paper [2] records in detail the results of comparative tests of the agglutinative activity of therapeutic serums from different laboratories, together with the results of serum therapy in 606 cases. Additional data have been included in this report; the average agglutinative titers of the serums have also been charted to facilitate comparison.

The character of the disease processes, the virulence of the infection, whether it is endemic or epidemic, whether it is early or late in the course of an outbreak, on the one hand, and, on the other, the quality of the serum and the stage of the disease at which it

1. Wadsworth, A. B.: Review of Recently Published Reports on the Serum Treatment of Type I Pneumonia: Together with a Report of 445 Additional Cases, Am. J. Hyg. 4: 119 (March) 1924.

2. Wadsworth, Augustus B.: Meningococcus Meningitis: The Results of Recent Investigation in Relation to Serum Therapy, Am. J. Hyg. 14: 630 (Nov.) 1931.

was given, all affect the results and the rate of mortality. The additional 136 cases in which the patients were treated with serum H since the last report only slightly increase the mortality—18.4 per cent, as compared with 17.8. Comparison with the statistics of other observers since the early work of Flexner is difficult because conditions of treatment vary, as does also the severity of the disease. Many patients with fulminating cases die irrespective of the serum used. Among these cases bacteremia rarely occurred without meningitis. The cerebrospinal processes usually determine the course of the disease. Intravenous administration of the serum, while it affords the opportunity of introducing larger quantities of serum and thus protecting the body generally, should not supplant intraspinal or intracisternal injection. If used at all, it should follow rather than precede the other methods of administration.

Treatment as soon as a diagnosis is established and adequate dosage are essential. The severity of the disease is not a contraindication; even patients with

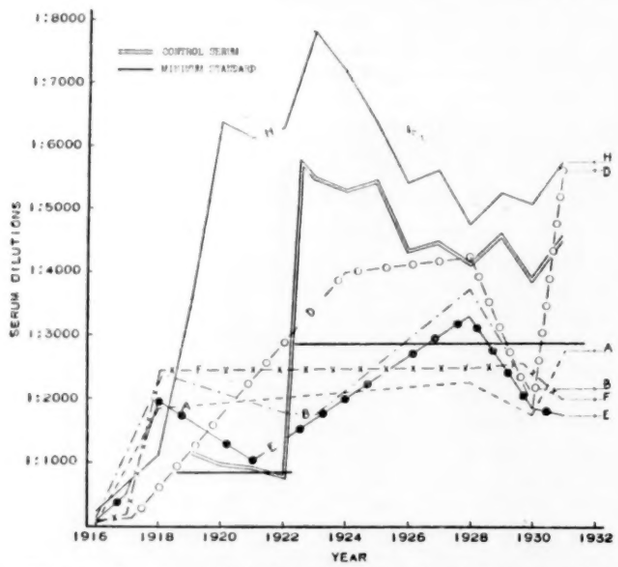

Chart 1.—Average agglutinative titers of antimeningococcus serums from different laboratories with New York State standard strains.

cases that appear to be of the fulminating type do, in some instances, respond to serum treatment and recover. The practical value of concentrating the serum has not been demonstrated, and without more satisfactory methods of standardization than are available at present it will be difficult to determine.

The cases have been classified according to age groups in order to record the mortalities of each group as well as the total mortality; the cases in which the patients were treated with more than one serum are recorded in a separate table. Comparison of the results of treatment with more than one serum with the results of the titration of the potency of these different serums by the agglutination test is of interest in that by far the greater number of cases responded to the serum of the highest agglutinative titer, and the mortalities in the cases so grouped indicate a corresponding therapeutic potency.

ANTISTREPTOCOCCUS SERUM

A renewed interest in the serum therapy of scarlet fever has followed the studies of Dochez and the Dicks. Further studies of the toxins of the streptococci, from scarlet fever, erysipelas and other forms of streptococcus infection have revealed the fact that although these toxins differ and might conceivably be grouped according to their reactions, no one group is associated with any particular type of infectious process—quite the contrary. Strains among the streptococci isolated from the throats of patients with scarlet fever or from the blood stream produce toxins that may have

TABLE 3.—*Patients with Meningococcus Meningitis Treated with Antimeningococcus Serum 1920—(April) 1932*

Ages	Total	Recoveries	Deaths	Mortality, per Cent
Under 1 year	131	83	48	36.6
1 to 2 years	58	49	9	15.5
2 to 5 years	144	133	11	7.6
5 to 10 years	128	113	15	11.7
10 to 20 years	157	134	23	14.6
20 years and over	124	93	31	25.0
Total	742	605	137	18.4

a narrow or an extremely broad valence and a high or a low potency, when tested on susceptible animals. The same is true of the streptococci obtained from cases of erysipelas, septic sore throat and puerperal and other infections. Moreover, the toxin of a streptococcus strain may incite a reaction that is neutralized by a specific serum in one susceptible person and not in another. Similarly, the immune serum produced in one animal species when compared with that produced in another may differ in the neutralization of the homologous toxin, depending on the animal in which it is tested. An immune serum may only partially neutralize a heterologous toxin, or may neutralize the toxins of other strains, the immune serums of which do not neutralize its toxin. Thus it is that the interaction of these different toxins with their immune serums in different animal tissues is a complex mechanism at present little understood. Nevertheless, it is these activities that determine the selection of strains for the production of satisfactory serums in the treatment of infection.

Whether the relationship of the streptococcus to scarlet fever is a primary or a secondary one, the streptococcus processes are the ultimate objectives from the practical standpoint of effective serum therapy. It is most unfortunate that the serums for the treatment of this disease have lacked valence and

TABLE 4.—*Patients with Meningococcus Meningitis Treated with More Than One Serum*

Results of Treatment	Cases	Recovered	Died	Mortality, per Cent
Serum H ineffective; other serum effective	7	3	4	57.1
Results indeterminate*	139	108	31	22.3
Serum H effective; other serum ineffective	52	48	4	7.6
Total	198	159	39	19.6

* Cases classified as indeterminate:
1. Data incomplete—clinical observations not recorded, although it is known that a change of serum was made because of the lack of improvement.
2. Change of serums so frequent as to render it impossible to correlate improvement definitely with any one serum, despite fluctuations in the cell count and a diminution in cocci.

a sufficient potency. Efforts to improve the quality of the serum have not been lacking. As a result of conferences, the federal authorities established a minimum standard of potency for these serums, namely, 200 units per cubic centimeter, and also methods of testing with standard toxin and antitoxin for control.

Titration of samples of serum from different laboratories since 1927 has revealed the fact that, with the exception of one laboratory, the margins by which the minimum requirements were exceeded were insufficient, especially since when tested with different toxins, some of the serums possessed only a narrow range of activity. Progress was so unsatisfactory that the Public Health

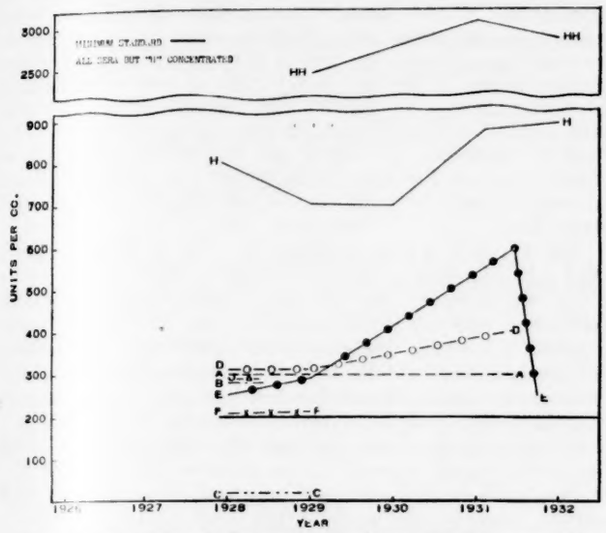

Chart 2.—The antitoxic potency of antistreptococcus serums from different laboratories—titrated with federal standard toxin.

Council of New York State, with the approval of the National Institute of Health, established independently a minimum standard of potency of 400 units per cubic centimeter and methods of testing against a standard toxin to insure the availability of serums of sufficient potency and valence. It would appear that the adoption of these regulations excluded even those serums which were manufactured under license of the Scarlet Fever Committee and approved by them for distribution. The results of the titration of these serums, according to the federal and state standards, have been recorded in two charts.

TABLE 5.—*Patients with Scarlet Fever Treated with Unconcentrated Antistreptococcus Serum, Titer from 600 to 900 Units Per Cubic Centimeter*

		Recoveries						
			Complicated Cases; Serum Treatment					
Type of Case	Total	Uncomplicated Cases	Improved Effective	Improved Condition	Inconclusive	Not Effective	Deaths*	Mortality, per Cent
Severe.....	402	214	93	18	24	11	42	10.4
Moderate...	441	342	51	15	17	12	4	0.9
Mild.....	209	186	16	3	4	..	0	0.0
Total.....	1,052	742	160	36	45	23	46	4.3

* Of the 46 fatalities, 35 had complications; 11 had none, but 2 of these were fulminating types, 1 severely toxic, and 8 received their first dose of serum less than twenty-four hours before death.

Premature conclusions not only as to the limitations of serum therapy but with respect to the etiologic relationship of a specific streptococcus have also greatly impeded progress. It is necessary to stress the development of a broader valence in the serum and also its application to other forms of streptococcus infection, since it has not been possible to recognize a strain specific to scarlet fever.

The serum that we have distributed for the treatment of streptococcus infection in New York State is monovalent, prepared by the immunization of horses with a single strain of streptococcus—the Dochez N. Y. 5. It is not concentrated, and its antitoxic potency, as determined by titration against both the federal and the state standard toxins, is at least 800 units per cubic centimeter. It has definite protective action as determined by tests in mice.

The reports on the use of this serum that we have received now include many forms of streptococcus infection: 1,052 cases of scarlet fever, 194 of erysipelas and a miscellaneous group, including septic sore throat, cellulitis, mastoiditis and puerperal infection, some of

TABLE 6.—*Patients with Erysipelas Treated with Unconcentrated Antistreptococcus Serum, Titer from 600 to 900 Units Per Cubic Centimeter*

		Recoveries; Serum Treatment				
Type of Case	Total	Effective	Doubtful	Not Effective	Deaths	Mortality, per Cent
Severe.....	106	67	19	7	13	10.6
Moderate.....	53	40	6	4	3	5.6
Mild.....	16	12	2	2	..	....
Not recorded.....	19	13	5	1	..	....
Total.....	194	132	32	14	16	8.2

them with bacteremia. The results in the treatment of scarlet fever confirm the conclusions of previous observers; namely, that the serum is most effective in cases predominantly toxemic, whether mild or severe. The general impression that the serum has no effect on the complications may be questioned, especially since the potency of the serums generally available has been so unsatisfactory and the doses have been so utterly inadequate for the treatment of streptococcus infection characterized by a bacteremia or a parasitic invasion of the tissues. Doses of from 10,000 to 20,000 units should be used in such cases and should be repeated at twelve or twenty-four hour intervals if necessary.

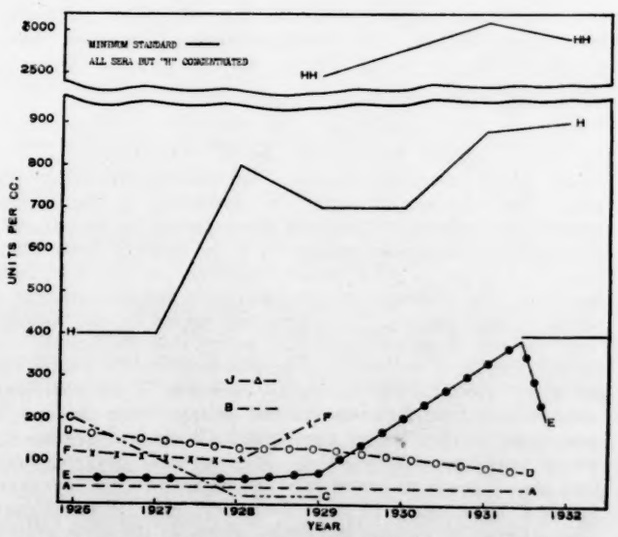

Chart 3.—The antitoxic potency of antistreptococcus serums from different laboratories—titrated with New York State standard toxin.

In erysipelas the effect of the serum on the toxemia is quite similar to that observed in scarlet fever, and this is the first manifestation of a beneficial action. In some instances the local processes subside almost coincidentally; in other instances, after a longer or a shorter interval. There are cases of erysipelas, as of scarlet fever, in which the serum appears to have no

action. The results in septic sore throat were definitely favorable, especially when the serum was administered early. Comparatively few patients failed to respond. The reports on 194 cases of erysipelas have been classified in table 6 according to the severity of the disease, as to whether the serum was effective or had no definite action and whether the patient recovered or died.

The attenuation that the bacterial incitants of infection undergo in the tissues has recently aroused widespread interest. Quite apart from the significance of the cultural variation, colony formation and various serologic reactions that have been so extensively studied of late, the fact that a virulent incitant, such as the pneumococcus, as a result of survival in the tissues of an animal that is immune, may lose its virulence and undergo fundamental biologic attenuation is especially significant. The pneumococcus and streptococcus are closely related bacterial species. As our study of the streptococci has progressed it seems most reasonable to attribute the variation in virulence, in toxin production and in antigenic action in the tissues to attenuation due to a similar survival in infectious processes in different parts of the body or to a prolonged existence as a relatively harmless parasite. Many of the streptococci from fatal human infections lack virulence when tested in laboratory animals, and produce little or no toxin, whereas others from less serious conditions—from those of the pharynx, for example—are not only virulent, but toxigenic.

The serum therapy of streptococcus infection should be developed from a broad point of view. We are only on the threshold of this field of serum therapy. Many, if not all, of us, whether in the laboratory or at the bedside, are bewildered by the uncertainty of our knowledge, and it is not so much the purpose of this paper to urge the treatment of streptococcus infection in general, as it is to stimulate the painstaking investigation of the mechanism of the action of the streptococcus toxin in order that effective serums may be produced and may be available for early and intensive treatment before the streptococcus processes have advanced to a stage where the prognosis becomes definitely unfavorable.

ABSTRACT OF DISCUSSION

DR. W. G. SMILLIE, Boston: Dr. Wadsworth said, "The early administration of serum in pneumonia of the highest potency and valence in adequate doses cannot be too strongly emphasized if favorable results are to be obtained from treatment." I wish to place special emphasis on the first three words of that sentence; namely, the early administration of a serum of high potency. It is generally agreed by men familiar with the use of antipneumococcus serum that the results will be unfavorable if the serum is administered on the fourth day or later. Results will be highly favorable if the individual infected with type I pneumonia can be treated on the first or second day of the disease; correspondingly, in later periods the serum would be of little value. It is perfectly obvious, therefore, that if one is to secure good results with antipneumococcus serum it is necessary to treat the patient early in the disease. This will not be possible in hospital cases, as the great proportion of cases are not admitted to the hospital until the third or fourth day of the disease. It is most essential, therefore, that if good results with antipneumococcus serum are to be secured, the serum must be available to the family physician. How is it possible to bring this about? A brave attempt has been made in one of the states. It is purely an experiment, but it is worth while reporting. Six or eight areas were selected in the smaller communities in the state. In each one of these areas a physician was selected who should be the pneumonia consultant for the area. These consultants were brought to the large medical center and given a special course in pneumonia therapy. The technicians from the local hospitals in the areas were then given special training in pneumococcus typing. A concentrated type I and II serum was furnished free by the state to the various consultants. All physicians in the area were informed that this service was available. If any physician desired this service he, immediately on suspecting a case of pneumonia, called in the consultant. If the patient was too poor to pay for the consultant and the service, the state paid the consultant a flat fee of $15 for his service. Usually the case was seen the first or second day of the disease. If a definite diagnosis of lobar pneumonia was made at the bedside, serum was administered at once, irrespective of the type of the case. It so happens that approximately 25 per cent of the cases of lobar pneumonia in this state are type I. Sputum was obtained at the same time, and within a reasonable time, usually within twelve hours, the type of pneumonia the patient had was known. If the pneumonia was type I or type II, the serum was continued. If the pneumonia was not type I, it was felt no particular harm had been done.

DR. HAROLD AMOSS, Durham, N. C.: In China, where I had an opportunity to observe a most virulent form of scarlet fever, the mortality was very high. Patients admitted on the second or third day of the disease with the most marked symptoms of a toxemia, sometimes with hemorrhage, and evidence of overwhelming toxemia were in some instances dramatically relieved by serum. There were patients admitted as early as the forty-ninth hour of a severe attack of scarlet fever who died between the fourth and the fifth day regardless of the amount of serum injected. Some patients weathered this particular stage of the disease and apparently improved to a slight extent, later to have complications, such as cervical adenitis, beginning the ninth to the eleventh day. Many of them died between the eleventh and the fourteenth day with streptococcemia. Dr. Wadsworth called attention to the fact that the monovalent serum that has been produced for the treatment of scarlet fever has been useful or suggestively useful in the treatment of other streptococcal infections. We had the opportunity to confirm this, and also had results which suggest that antierysipelas serum prepared from six strains may be, in some cases, effective in scarlet fever. We had some data which lead us to believe that in the treatment of scarlet fever we must have more than a purely antitoxic serum, and to that end Dr. Richard Sia of the Peiping Union Medical College is preparing a multivalent antiscarlatinal serum by a method designed to provoke antibacterial as well as antitoxic properties.

DR. VIRGIL E. SIMPSON, Louisville, Ky.: The Committee on Arrangements of the United States Pharmacopeia is now considering the acceptance or rejection of various serums in the eleventh edition of the U. S. Pharmacopeia. We are confronted with several problems in connection therewith and I have been particularly interested in the point of view stressed this afternoon. One of the things with which we are confronted is the question of patent rights, and so forth, which cover some of these products, and the Committee on Revision will appreciate such expressions of opinions as any may wish to send within the next two months to guide us in our work.

DR. AUGUSTUS B. WADSWORTH, Albany, N. Y.: I wish to stress the point that Dr. Amoss made. That is one reason I pointed out that the serum was monovalent and there were cases of scarlet fever and of erysipelas which did not respond; also, as shown in the charts, that even though serum H was monovalent—produced with a single strain—it had a broader valence than the other serums with which it was compared and which were produced by four or more strains. In presenting this work on the antistreptococcus serum, I do not wish to give the impression of endeavoring to stimulate the treatment of streptococcus infections in general, although that is the ultimate objective, so much as to stress the importance of an intensive study of the toxin production by these different strains and their antigenic action; that is, their immunizing action in producing serums. It is of the utmost importance in developing this serum, from the standpoint both of potency and of valence, that appropriate strains be selected, and that is the step on which we are now working intensively in an endeavor to complete the range of probable valence necessary. We have studied now at least 1,000 strains of streptococci, and I do not think we have found more than twelve or fifteen that are satisfactory.

The work in Massachusetts has interested me and I am sure Dr. Smillie will find it most successful. It is practically what we have been doing in New York State, and very successfully indeed, for the past fifteen years. It is practical and it will be a public service.

POSTOPERATIVE PULMONARY COMPLICATIONS

A STUDY OF THEIR RELATIVE INCIDENCE FOLLOWING INHALATION ANESTHESIA AND SPINAL ANESTHESIA

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AND
MARTIN WARREN DEBENHAM, M.D.
SAN FRANCISCO

In a previous communication,[1] the belief was expressed by one of us (A. L. B.) that the incidence of postoperative pulmonary complications, especially atelectasis, appeared to be greater following spinal (subarachnoid) anesthesia than after inhalation anesthesia. To determine the validity of this impression, the statistical studies here reported were undertaken. They are founded on an unselected group of 812 consecutive case histories of patients operated on at the San Francisco Hospital (surgical service of the University of California Medical School) and at the University of California Hospital, from July 1, 1929, to June 31, 1930. During this period an intensive study was made of all cases regarding the development and prevention of various postoperative pulmonary complications regardless of the type of anesthesia used. The choice of anesthesia depended on the individual surgeon. The tables show that about as many "serious major" operations were done under general anesthesia as under spinal anesthesia; but it should be noted that the consensus of the surgical staff is that the old patient, the patient in shock, the patient who is a poor risk generally, should not be given a spinal anesthetic. Hence more of these patients were operated on under an inhalation anesthetic. In spite of this, postoperative pulmonary complications were almost five times more frequent after spinal anesthesia than after inhalation anesthesia (table 1). Patients who received both types of anesthesia are not included in these studies.

It is noted, moreover, that this adverse ratio for spinal anesthesia still is evidenced when the cases are grouped by the region of the body operated on, or by the type of operation performed (tables 2, 3, 4, 5, 6 and 7).

The average duration of operation was more than half again as long under spinal anesthesia as under general anesthesia. Postoperative pulmonary complications were 4.29 times more frequent after spinal anesthesia than after general anesthesia (table 8).

In the majority of instances, atelectasis was the complication found. Moreover, as has been pointed out

TABLE 1.—*Postoperative Pulmonary Complications Following Inhalation and Subarachnoid Anesthesia*

	Total Cases	Postoperative Pulmonary Complications	Percentage of Complications
Inhalation anesthesia	474	6	1.3
Subarachnoid anesthesia	338	25	7.4

TABLE 2.—*Postoperative Pulmonary Complications Following Abdominal Surgery*

	Inhalation Anesthesia			Subarachnoid Anesthesia		
	Cases	Complications	Per Cent	Cases	Complications	per Cent
Upper abdomen	13	0	0	41	8	20.5
Appendectomy	31	3	10	90	8	8.9
Herniotomy	19	0	0	45	6	13.3
Total	63	3	4.8	176	22	12.5

TABLE 3.—*Postoperative Pulmonary Complications in Surgery of Lower Extremity and Perineum*

	Inhalation Anesthesia			Subarachnoid Anesthesia		
	Cases	Complications	Per Cent	Cases	Complications	Per Cent
Rectal fistulas	12	0	0	17	3	2
Bone surgery (open)	20	0	0	24	1	4
Closed manipulations	45	0	0	22	1	4.5
Amputations	14	0	0	21	1	4.7
Hydrocele	3	0	0	9	0	0
Incision of abscess	56	0	0	15	0	0
Miscellaneous	20	0	0	9	0	0
Prostatectomy	1	0	0	15	0	0
Hemorrhoidectomy	1	0	0	19	0	0
Total	172	0	0	151	6	4

TABLE 4.—*Postoperative Pulmonary Complications in Surgery of the Torso*

	Inhalation Anesthesia			Subarachnoid Anesthesia		
	Cases	Complications	Per Cent	Cases	Complications	Per Cent
Operations on kidney	17	0	0	2	0	0
Cystotomy	2	0	0	7	0	0
Spine	9	0	0	0	0	0
Thorax	6	0	0	0	0	0
Miscellaneous	21	0	0	2	0	0
Total	55	0	0	11	0	0

TABLE 5.—*Postoperative Pulmonary Complications in Surgery of Head, Neck and Upper Extremity*

	Inhalation Anesthesia			Subarachnoid Anesthesia		
	Cases	Complications	Per Cent	Cases	Complications	Per Cent
Bone surgery (open)	17	0	0	0	0	0
Closed manipulation	29	0	0	0	0	0
Mastoidectomy	40	0	0	0	0	0
Incision of abscess	60	1	1.7	0	0	0
Thyroidectomy	9	1	11.1	0	0	0
Ear, nose, throat, nerve and miscellaneous	29	1	3.4	0	0	0
Total	184	3	1.7	0	0	0

TABLE 6.—*Summary of Complications by Regions of the Body Operated On*

	Inhalation Anesthesia			Subarachnoid Anesthesia		
	Cases	Complications	Per Cent	Cases	Complications	Per Cent
Abdominal	63	3	4.8	176	22	12.5
Lower extremity and perineum	172	0	0	151	3	2
Upper extremity, head and neck	184	3	1.7	0	0	0
Torso	55	0	0	11	0	0
Total all cases	474	6	1.3	338	25	7.4

Supported in part by the J. J. and Nettie Mack Foundation.
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1. Brown, A. L.: Postoperative Pulmonary Atelectasis: Observations on the Importance of Different Types of Bronchial Secretion and Anesthesia, Arch. Surg. **22**: 976-982 (June) 1931.

frequently, the more closely the operative procedure approaches the region of the diaphragm, the greater is the incidence of postoperative pulmonary complications. The question naturally arises, Why does spinal anesthesia seem to increase the incidence of postoperative pulmonary complications, especially atelectasis? We can only repeat a previous statement [1] which one of us has made, to wit:

> At first thought, one would imagine the opposite to be true, that postoperative pulmonary atelectasis would occur more frequently following inhalation anesthesia. But, on closer consideration, several reasons are noted why spinal anesthesia might predispose to this complication. First, spinal anesthesia definitely inhibits the depth and force of respiratory movements, not only during the operation itself, but for a considerable period thereafter. It is these respiratory movements (both intrinsic and extrinsic) which tend to rid the tracheobronchial tree of foreign matter or secretions. Second, the normal viscosity of the secretions of the tracheobronchial tree appears to be increased, i. e., the material is more tenacious following

TABLE 7.—*Classification by Type of Postoperative Pulmonary Complication Diagnosed*

	Inhalation Anesthesia				Subarachnoid Anesthesia			
	Atelectasis	Bronchopneumonia	Hypostatic Pneumonia	Infarct	Atelectasis	Bronchopneumonia	Hypostatic Pneumonia	Infarct
Upper abdomen	0	0	0	0	5	2	1	0
Herniotomy	0	0	0	0	4	2	0	0
Appendectomy	2	1	0	0	3	3	0	2
Lower extremity	0	0	0	0	1	1	1	0
Upper extremity	2	1	0	0	0	0	0	0
Total	4	2	0	0	13	8	2	2

TABLE 8.—*Comparison of Average Duration of Operations (in Minutes)*

	Average Duration Under Inhalation Anesthesia	Average Duration Under Subarachnoid Anesthesia
Abdomen	60	90
Torso	50	100
Lower extremity	35	45
Upper extremity	47	..

spinal anesthesia. Third, following operation under spinal anesthesia the patient tends to remain relatively quiet for a number of hours. One has, then, a more tenacious sputum and decreased or impaired factors that might tend to free the tracheobronchial tree of this material. The increased possibility for this material to obstruct or plug a bronchus and the subsequent development of atelectasis appear reasonable.

It is further to be noted that spinal anesthesia markedly increases the time required for the operative procedure.

SUMMARY

1. Statistics showing the relative incidence of postoperative pulmonary complications following inhalation anesthesia and subarachnoid anesthesia are presented.

2. In this series of 812 cases, postoperative pulmonary complications were 4.29 times more frequent after subarachnoid anesthesia than after inhalation anesthesia in spite of the fact that more "bad risk" patients were operated on under inhalation anesthesia.

3. The adverse ratio for subarachnoid anesthesia is found regardless of the region of the body operated on or the type of operation performed.

4. The more closely the operative procedure approaches the diaphragm, the greater is the incidence of postoperative pulmonary complications.

SPINAL ANESTHESIA

ITS EFFECT ON THE CENTRAL NERVOUS SYSTEM

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In reviewing the literature on spinal anesthesia, one is surprised to find a large number of articles in which thousands of cases have been reported, but few of them give the clinical observations of the neurologic examination and the neurologic complications and necropsy observations.

Barker,[1] Pitkin,[2] Babcock,[3] Koster,[4] Labat [5] and others have described the technic of spinal anesthesia. In the series of cases composing the present report, the method of administering the anesthesia was the same. The patients were given morphine half an hour before the operation and ephedrine sulphate subcutaneously immediately before the spinal puncture. The spinal punctures were done with the patient lying on his side. About 3 cc. of spinal fluid was removed and 1.5 cc. of apothesine (γ-diethylaminopropyl cinnamate hydrochloride, N. N. R.) injected slowly without barbotage, and then the patient was immediately placed in the Trendelenburg position.

Eleven consecutive cases in which operation was done for prostate disease were studied. The ages of the patients varied from 50 to 70 years. Complete neurologic examinations were done before and during the operation, six hours and twenty-four hours after the operation, and finally before discharge from the hospital.

After administration of the anesthesia, the patients noticed numbness of the extremities. This was followed by a loss of pain, heat and cold sensation. The segmental level reached to about the eleventh dorsal segment in all instances except one, in which the level rose to the second cervical segment. Sense of motion and position of the toes was lost in two cases and vibratory sense was impaired in two others. In six cases there was a marked vasomotor reaction below the level of the anesthesia. During the operation, anesthesia was so established that the surgeon's work was unimpaired by the patient's complaints. No sensory changes were demonstrable six hours after operation.

Soon after the sensory conditions were noted, the knee and achilles jerks were not obtained and this condition lasted for nearly six hours, when the reflexes were found to be more active than on the original examination. All the patients were able to move their legs actively during the period of anesthesia. In six cases, positive Babinski signs were noted. These manifestations disappeared within two weeks in all cases except two.

The most common sequel was the complaint of pain in the extremities, particularly the legs, but also in the back and, in one instance, the head. The pain in the legs persisted in three cases for several months and on the

From the Neurological Service of the University Hospital, University of Michigan Medical School.

1. Barker, A. E.: Clinical Experience with Spinal Anesthesia in One Hundred Cases, Brit. M. J. **1**: 665-674, 1907.
2. Pitkin, G. P.: Controllable Spinal Anesthesia, Am. J. Surg. **5**: 537-553 (Dec.) 1928.
3. Babcock, W.: Spinal Anesthesia: An Experience of Twenty-Four Years, Am. J. Surg. **5**: 571-576 (Dec.) 1928.
4. Koster, Harry; and Kasman, L. P.: Spinal Anesthesia for the Head, Neck and Thorax: Its Relation to Respiratory Paralysis, Surg., Gynec. & Obst. **49**: 617-630 (Nov.) 1929.
5. Labat, Gaston: Elimination of Dangers of Spinal Anesthesia, Am. J. Surg. **5**: 625-632 (Dec.) 1928.

last examination was still in existence. In these cases there resulted a marked muscle tenderness in the extremities, which persisted for several months.

In the case in which the sensory level reached the second cervical segment, the patient had a severe headache, rigidity of the neck, and a positive Kernig sign. The tendon reflexes were active. There was a marked hyperesthesia over the body. There was a positive Babinski sign on the left. Vibratory sense was lost in the ankles, and there was a loss of the sense of motion and position of the toes. Within twenty-four hours there was also noted a paralysis of the right external rectus muscle. These conditions persisted for several weeks and in addition there developed a corneal ulcer. At the time of discharge from the hospital, the patient was asymptomatic except for pains in the arms and legs.

There were no apparent changes in the spinal fluid after the operation. The cell count was normal and there was no increase in albumin or globulin. The colloidal gold and mastic reactions were negative.

In this series, two patients died; the first, twenty days after operation:

His only complaints up to two days before his death were weakness and pains in the extremities. He suddenly went into coma, at which time his blood pressure was 138 systolic and 72 diastolic. The nonprotein nitrogen was 55.6 mg. The heart showed mild cardiac decompensation. The neurologic examination was negative except for diminished tendon reflexes. An autopsy was performed five hours after death. The pathologic diagnosis by Dr. C. V. Weller was as follows: Section of the spinal cord and meninges showed congestion and numerous small psammoma bodies in the meninges. The brain demonstrated congestion and edema in the meninges and brain substance. Throughout the lower portion of the pons and upper medulla there were numerous small false psammoma bodies of the myelin droplet type. There was advanced chronic bilateral ascending purulent pyelitis and pyelonephritis, hyperplasia of the prostate with urinary obstruction, urinary extravasation through areas of necrosis in the bulba urethrae, subacute purulent cystitis and prostatitis with fibrinopurulent exacerbation in the operative field, hypertrophy of the bladder musculature, generalized arteriosclerosis (most marked in the aorta and coronaries), calcifying endocardial sclerosis, myocardial fibrosis, nutmeg liver, and chronic adhesive pleuritis.

The second patient, who died twelve days following operation and who had been treated previously for syphilis, showed no evidence of organic disease of the central nervous system at the first examination. Following operation, he complained of pains in his arms and shoulders. The Kahn reaction, as well as other spinal fluid examinations, was negative. He had good anesthesia during the operation, but immediately following it he was confused and cooperated poorly. Apparently he was able to feel pain, and the tendon reflexes were hyperactive. The pathologic diagnosis made by Dr. C. V. Weller was as follows: There was edema of the meninges and spinal cord. No myelinosis was present in the upper cervical cord and in the medulla, but in the lower cord there was a marked myelinosis, especially near the meninges. Some small nerve roots showed an extensive degeneration of the fibers with a loss of myelin sheaths. There was advanced adenocarcinoma of the prostate, metastasis in regional and bronchial lymph nodes and vertebrae, partial transurethral recession of the prostate, chronic purulent cystitis, right ureteritis, pyelitis and pyelonephritis, pyemic abscess in the kidneys, pulmonary emboli, purulent lobular pneumonia, old syphilis (myocarditis, aortitis, hepatitis, suprarenalitis, orchitis), coronary and aortic arteriosclerosis, and endocardial sclerosis, with calcification.

Another patient, who was referred from a Detroit hospital to the University Hospital, complained of pain in the extremities and severe headaches. She had previously been studied well in the former hospital and was operated on eleven months before, when a cervical hysterectomy was done. At that time she received 170 mg. of procaine hydrochloride for the spinal anesthesia. Following the operation, the complaints were numerous. She complained particularly of headaches and of pains in the extremities. On admission to the University Hospital, she was well nourished and not acutely ill. There was no rigidity of the neck and no enlargement of the glands. The right pupil was larger than the left; they both reacted to light, but the left better than the right. The ocular fundi showed a slight endarteritis of the retinal arteries, and the visual fields were normal. There was a slight nystagmus on lateral deviation of the eyeballs to either side. There was no paralysis of the face or tongue. She drew back the angles of the mouth equally well on the two sides. There was a fine tremor of both hands on extension. The fingers were held in a somewhat peculiar position, about the same on the two sides. The biceps and triceps jerks were a little more prompt on the left side than on the right. The left knee jerk was more prompt than the right. The achilles jerks were about equal. There was no swelling of the ankles. She said that she felt pinpoint about equally well on the hand and on the two sides of the face. The neurologic examination appeared to indicate some organic brain lesion, but the manifestations were not definite. It was considered that the patient might have an encephalomyelitis, probably resulting from the previous spinal anesthesia, as these symptoms apparently developed from that time.

Fawcett [6] believes that paralysis of the sixth nerve may be accompanied by photophobia, headache, dizziness, hallucinations and tetanic contractures. He believes that extra-ocular muscle paralysis is a rare complication of spinal anesthesia and that the symptoms vary from three days to three weeks. MacLachlan [7] reports a case of disseminated encephalomyelitis following spinal anesthesia. Donovan, Beretervide and Rechniewski [8] have described a case of meningomyelitis following spinal anesthesia. Degenerative myelitis has been reported by Nonne and Demme.[9] Devraigne and his co-authors [10] had a case of quadriplegia following anesthesia. Evans [11] gives as a complication of spinal anesthesia meningism, purulent meningitis, neuritis, nausea and vomiting.

One may advance the theory that all spinal anesthesias produce an acute myelitis. This condition usually lasts a few hours and may leave the patient with complaints of pain and paralysis for a period, but there are times when there is a permanent involvement of the nervous system both clinically and pathologically. The fact that there may be certain definite residuals from this method of anesthesia must be recognized.

Falk,[12] Arnheim and Mage,[13] Koster [14] and others have reported death following spinal anesthesia. Usually it is believed that death occurring within a few minutes to a few hours following the puncture is due to the spinal anesthesia, but when it occurs several days later this is not considered to be the cause. However, rarely are the central nervous system complications given in these reports. When death is caused from the spinal anesthesia, it is usually attributed to the position in which the patient is placed following the injection, fall in blood pressure, or circulatory

6. Fawcett, K. R.: Extra-Ocular Muscle Paralysis Following Spinal Anesthesia, Minnesota Med. **14**: 648-649 (July) 1931.
7. MacLachlan, T. K.: Disseminated Encephalomyelitis Following Spinal Anesthesia, Brit. M. J. **2**: 11-12 (July 4) 1931.
8. Donovan, R.; Beretervide, J. J., and Rechniewski, C.: Meningomielitis enun heredo-especifici consecutiva a una raquianesthesia, Rec. Soc. de med. int. y tisiol. **4**: 67-72 (June) 1928.
9. Nonne, M., and Demme, H.: Degenerative Myelitis nach Spinal-Anästhesie, Wien. klin. Wchnschr. **41**: 1002-1005 (July 12) 1928.
10. Devraigne, Suzor, and Laennec: A Propos de l'anesthésie rachidienne; observation de quadriplegie après rachi anesthésie guérie rapidement, Bull. Soc. d'obst. et de gynéc. **16**: 319 (May) 1927.
11. Evans, C. H.: Spinal Anesthesia, New York, Paul B. Hoeber, Inc., 1929.
12. Falk, H. C.: Deaths from Spinal Anesthesia, Am. J. Surg. **11**: 461-468 (March) 1931.
13. Arnheim, E. E., and Mage, Sigmund: Spinal Anesthesia, Ann. Surg. **93**: 929-933 (April) 1931.
14. Koster, Harry: Spinal Anesthesia, Am. J. Surg. **5**: 554-570 (Dec.) 1928.

changes.[15] It is considered by many who use spinal anesthesia that the use of procaine hydrochloride and allied drugs results in no permanent damage to the central nervous system.

In 1903, Spielmeyer[16] found involvement of the ganglion cells in that there was chromolysis, dissolution of the Nissl bodies and rounding of the cell bodies, also dissolution of the nuclear membranes. This was believed to be a circulatory disturbance. He also saw similar lesions in the large anterior cells of the spinal cord, so he believed there was a direct toxic effect on the axis cylinders with secondary degeneration of the ganglion cells. The most intense reaction was present in the nerve fibers in the anterior column of the cord. Brunn,[17] in 1922, noted swelling of the nucleus of the ganglion cells and wandering toward the periphery after spinal anesthesia. These changes were visible after the cessation of anesthesia. Davis and his associates,[18] in 1931, working with dogs, found that the spinal anesthetic solutions in common use today were hemolytic as well as myelitic and would seem to act on the myelin of the nerve fibers as they do on the lipoids of the red blood cell membranes, causing its dissolution. He noted varying degrees of inflammatory reaction in the leptomeninges, passive changes in the ganglion cells of the gray matter of the cord similar to those seen in retrograde or so-called wallerian degeneration, swelling and fragmentation of the axis cylinders, and also signs of degenerative changes in the fiber tracts of the spinal cord.

CONCLUSION

I have attempted to show the clinical changes during and following spinal anesthesia and some of the sequelae and complications. There have also been reported two cases in which death occurred several days following the anesthesia, with pathologic observations. It appears that the anesthesia was a contributing cause for the deaths. The permanent effects of the drug were seen at necropsy. In the last case, the spinal cord was noted to be normal in the cervical region, and in the lower dorsal and lumbar regions definite pathologic changes were noted. It has been said by several observers that there is no irritation in the nervous system following the injection of procaine or its allied drugs and they compare this finding with irritation produced by the inhalation method on the mucous membranes of the bronchi and lungs. However, I feel that there is a definite toxic effect on the spinal cord and the spinal nerve roots, which shows its effect both clinically and pathologically, the patients usually complaining of pain, and this finding can be explained by the pathologic study of the nerve roots.

15. Seevers, M. H., and Waters, R. M.: Circulatory Changes During Spinal Anesthesia, California & West. Med. **35**: 169-173 (Sept.) 1931.
16. Spielmeyer, W.: Veranderungen des Nervensystems nach Stovainanasthesie, München. med. Wchnschr. **55**: 1629-1634, 1908.
17. Brunn, von, Max: Die Lumbal anasthesie in Neue deutsche Chirurgie, Stuttgart **29**, 1922.
18. Davis, Loyal; Haven, Hale; Givens, J. H., and Emmett, John: Effects of Spinal Anesthesia on the Spinal Cord and Its Membrane, J. A. M. A. **97**: 1781-1785 (Dec. 12) 1931.

The Asbestosis Body.—During the past two or three years, observations on the asbestosis body have been published with such frequency that it is very difficult to keep track of them all. . . . The first illustrations of the bodies were given by Cooke and Hill in their original description. Subsequently they were depicted by Simson in autopsies of South African cases. His paper also included a microphotograph of the bodies produced experimentally in the lung of the guinea-pig by Mavrogodato, the first occasion on which the bodies had been produced experimentally.—Gloyne, S. R.: *Lancet* **1**:1351 (June 25) 1932.

Clinical Notes, Suggestions and New Instruments

PLACENTAL FRAGMENT ENGRAFTED IN CERVICAL LACERATION

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Rarity alone warrants the report of a case in which a fragment of placental tissue becomes grafted in a cervical laceration. This placental fragment, 3 by 5 cm. in size, thrived for nearly a year after the establishment of its blood supply from the newly torn cervix. After a search of all available literature, I am unable to find that this unusual condition has been previously reported.

REPORT OF CASE

Mrs. J. E. T., aged 26, white, seen, Sept. 2, 1931, complained of vaginal bleeding, weakness and headaches. The present illness began ten months before with vaginal bleeding similar to a menstrual flow, though more profuse, which was present from fourteen to eighteen days out of each month. Since the onset the patient had lost 16 pounds (7.3 Kg.) and had rather severe dyspnea and palpitation of the heart. She had been confined to bed for the past month. Two months prior to the onset of the illness she stated that she had delivered normally a 10 pound (?) baby. The puerperium was uneventful, and she stated that her postdelivery lochia was of normal character, duration and amount, and similar to that experienced after each of her three preceding deliveries.

The patient had had the usual diseases of childhood without complications. The menstrual periods had always been regular before the present illness, with a duration of three or four days, without pain, and with an average amount of flow. One miscarriage occurred six years before, without complications. The history, other than as noted, was negative.

The patient was markedly anemic and emaciated, and she was very weak and dyspneic. The pulse was 120, the temperature 98. For brevity, I shall only mention the abdominal, pelvic and laboratory observations, the others being of no particular importance in this report.

There was generalized abdominal tenderness to palpation, most marked over the uterus. There were no masses palpable, no muscle rigidity, nor free fluid.

There was a bloody vaginal discharge. The Bartholin glands were not palpable. No pus was expressed from the urethra. The perineum was moderately relaxed. There were no labial ulcers. A firm mass, 3 by 5 cm., was felt protruding from the cervical canal. The uterus was of normal size, freely movable, in normal anteflexed position, and of normal consistency. Both fornices were normal, as was the culdesac. Visualization of the mass by means of a speculum revealed that it was angiomatous and was attached in an old cervical laceration. The slightest manipulation of the mass caused free bleeding both from the mass and from its site of attachment.

The red blood cell count was 2,872,000; hemoglobin, 58 per cent (Sahli), 8 Gm. per hundred cubic centimeters.

Examination of the urine revealed albumin, two plus; pus and blood, four plus.

The patient was immediately sent to Greenville City Hospital and matched for transfusion. She was given 500 cc. by the direct method. The following day, nitrous oxide anesthesia was administered and the mass was removed from its attachment to the cervical tear. There had been established a very good blood supply, and free bleeding followed from the raw cervical site of attachment. It was then, for the first time, evident to the operator that the mass was a placental fragment that had become grafted in a cervical laceration. The cervix was then slightly more dilated, being already partially dilated by the presence of the mass, and gentle curettement of the uterus was performed. Two small fragments of placental tissue were removed. The cervix was then cauterized, the vagina packed, and the patient returned to her room. After two or three days, all sanguineous drainage ceased. A ravenous appetite continued during the patient's stay of seven days in the hospital, and she was discharged feeling much stronger. The red cell count was 3,570,000, an increase of 700,000 in the seven days.

She was next seen four weeks later at the office, feeling fine, hemoglobin 85 per cent, and reporting a gain of 7 pounds (3.2 Kg.) in weight. She had had one normal menstrual period since her dismissal from the hospital, but no other bleeding. Pelvic examination was negative, and the cauterized cervix exhibited a very satisfactory appearance.

COMMENT

It was my opinion at first that this was an angiomatous polyp, although the possibility of a malignant lesion had to be considered. It was not until the mass was removed that the tissue was definitely known to be placental. As unusual as it might seem, there is no doubt about the viability and blood supply of this tissue, which the pathologist reported placental, and the fact that it was firmly attached in the cervical tear. The logical explanation of the occurrence is that the fragment, in its passage from the uterus, was grasped in a lacerated and contracting cervix, and followed the usual course of skin grafts.

Woodside Building.

HERPES ZOSTER AND TUBERCULOSIS OF THE SPINE

THEODORE ROSENTHAL, M.D., NEW YORK

The observation of a patient with typical herpes zoster who, sixteen months later, proved to have tuberculosis of the spine involving the same segments implicated in the zoster stimulated my interest in this subject. Mention of similar instances in the literature is indeed scanty. Standard textbooks on orthopedic surgery do not cite herpes zoster as an accompaniment or complication of tuberculosis of the spine. One work on neurology [1] states that herpes zoster may occur in caries of the spine, but recent dermatologic and orthopedic literature contains no reference to it.

REPORT OF CASE

Mrs. E. L., aged 46, white, born in Minnesota, had had no pregnancies and no miscarriages. She had always enjoyed good health. The family history was negative for tuberculosis.

In April, 1930, when I first saw her, she complained of a painful eruption in the left armpit. She presented numerous grouped vesicular lesions extending from a point just below the angle of the left scapula around to the left anterior part of the chest, and following the course of the intercostal nerves. The area involved corresponded fairly well with the seventh dorsal dermatome.

The lesions were tense, contained clear fluid, varied in size from pinhead to split pea, and were situated on erythematous bases. A diagnosis of herpes zoster was made, soothing antipruritic lotions were applied locally, and amidopyrine was given internally. One week later the lesions were crusted for the most part, and the patient felt very much better. She was told not to return, as she was considerably improved.

The patient was not seen again until January, 1932. At this time she complained of intense pain in the back, which she had had for several months. The pain was remittent in character, sharp, usually localized to the back, in the dorsal region, and occasionally radiating around to the lower part of the chest anteriorly, either unilaterally or bilaterally.

Following the involution of the zoster, the patient stated that she had been well until about eight months before her return, at which time the pain had commenced. She had grown worse progressively until she was unable to attend to her household duties, when she was forced to seek medical advice again.

At this time the patient was well developed but had the appearance of being chronically ill and appeared to be poorly nourished. The fingers of both hands showed enlarged and deformed interphalangeal joints. The pupils were equal, were regular, and reacted well to light and in accommodation. The knee jerks were hyperactive and the Romberg sign was negative. There was considerable pain on pressure in the middorsal region of the spine, with pain and limitation of motion on any movement of the spine. Blood Wassermann and urine examinations were negative.

The clinical picture strongly suggested disease of the spine, and the spine was therefore examined roentgenographically. The radiologist reported finding deformity and apparent fusion of the bodies of the seventh and eighth dorsal vertebrae, with complete obliteration of the intervertebral space between these two vertebrae, and stated that the appearance was characteristic of a tuberculous process involving the seventh and eighth dorsal vertebrae.

The occurrence of herpes zoster in the acute infectious diseases, and also in pulmonary tuberculosis is fairly well known. In 1879, Potain [2] said that the eruption sometimes appears as the precursor of tuberculosis (cette eruption parait quelquefois comme le prélude de la phtisie pulmonaire). Bärensprung [3] also pointed out many years ago that herpes zoster is common in pulmonary tuberculosis.

Rendu,[4] Huchard [5] and Magnüsson [6] have reported more recently instances of herpes zoster occurring in patients with phthisis. Bernardeau [7] observed a man with herpes zoster of the lumbosacral region who several weeks later developed tuberculosis of the bone. Conor [8] reported a case of acute tuberculous orchitis in a soldier who subsequently developed herpes zoster of the right intercostal region.

Barbier and Lian [9] and Loeper [10] observed cases of herpes zoster in children and adults suffering from tuberculosis elsewhere in the body and concluded that in these cases it was due to a posterior ganglion radiculitis of tuberculous origin.

The appearance of herpes zoster in surgical tuberculosis is less well known and has been commented on chiefly by the older observers.

E. Wagner [2] published a case report in 1870 of a man, aged 23, in whom, eight days before he died of pulmonary tuberculosis, a left intercostal herpes zoster developed involving the ninth and tenth intercostal nerves. At necropsy, tuberculosis of the last six dorsal and the first two lumbar vertebrae was found.

Dubler [11] reported an observation in a woman, aged 77, who complained of a right-sided thoracic zoster, extending from the seventh to the ninth ribs. Six months later it was found that she had a caseous periostitis of the seventh, eighth and ninth ribs on the right side.

Head and Campbell [12] mention three cases in which an outbreak of zoster corresponded with renewed activity of the tuberculous process in the spine.

In about half of all the cases recorded in the literature in which cases of herpes zoster came to necropsy and pathologic changes were found in the internal organs, an association of this disease with tuberculosis was observed. Thus, Arnstein,[13] in postmortem examination of thirty-six cases of herpes zoster, found evidence of tuberculosis in seventeen cases. Head and Campbell in their series of twenty-one necropsies, found tuberculous changes in ten cases.

The etiology of herpes zoster is still uncertain, and a discussion of it, in any event, is out of place in a report of this nature. Suffice it to say that there is almost universal agreement on a division of this condition into two types. The first, and probably the most common type, is looked on as a disease *sui generis*, an acute infection which has certain similarities and possibly relationship to epidemic encephalitis and varicella.[14]

The second type, or symptomatic zoster, resembling in all respects that arising spontaneously, may be produced by implication of a posterior root ganglion in inflammatory processes secondary to a malignant condition, tuberculosis or injury.

The case described herein is an example of the second type, in which undoubtedly there was a tuberculous infection of the posterior root ganglions adjacent to the seventh and eighth dorsal vertebrae. The involvement of the dermatome, or

1. Wechsler: Clinical Neurology, Philadelphia, W. B. Saunders Company, 1927. p. 272.
2. Quoted by Conor (footnote 8).
3. Bärensprung, quoted by Magnüsson (footnote 6).
4. Rendu: Abstr. Monatsch. f. prakt. Dermat. **19**: 572, 1894.
5. Huchard: Abstr. Monatsh. f. prakt. Dermat. **19**: 572, 1894.
6. Magnüsson, S.: Tubercle **6**: 482 (July) 1925.
7. Bernardeau: Abstr. Dermat. Wchnschr. **56**: 660, 1913.
8. Conor: Gaz. d. Hôp. de Paris **79**: 639, 1906.
9. Barbier and Lian: Progr. méd. **30**: 361, 1911.
10. Loeper: Abstr. Rev. neurol. **23**: 699, 1912.
11. Dubler: Virchows Arch. f. path. Anat. **191**: 195, 1884.
12. Head and Campbell: Brain **23**: 353, 1900.
13. Arnstein: Wien. Arch. f. inn. Med. **4**: 442, 1922.
14. Roxburgh, A. C.: Brit. J. Dermat. **39**: 13 (Jan.) 1927.

metameric skin region, corresponding to the dorsal roots implicated in the carious process in this instance, is noteworthy and of considerable clinical interest.

One may safely conjecture that if the full possibilities of this symptom complex had been realized at the time the patient exhibited the zoster, and the proper examinations made, the spinal disease would have been demonstrated. This early diagnosis, or at least a diagnosis established sixteen months earlier, would have been of incalculable importance to the patient.

SUMMARY AND CONCLUSIONS

1. A woman, aged 46, showed signs of tuberculosis of the spine sixteen months after an attack of herpes zoster. The carious vertebrae corresponded to the spinal segments involved in the zoster.

2. From a review of the literature, there seems to be a definite association between herpes zoster and tuberculosis, proved clinically and pathologically.

3. In view of this relationship, it might be well, in the future, to bear these facts in mind when seeing patients with herpes zoster.

115 West Eighty-Sixth Street.

KEROSENE POISONING IN CHILDREN

JULIAN P. PRICE, M.D., FLORENCE, S. C.

Kerosene poisoning is a rare condition in children, or at least it is a condition that is rarely reported in the literature. This is rather surprising since kerosene is still used in a great many households, especially in rural communities, and careful precautions are not always taken to keep it out of reach of small children.

During the past two years I have seen four cases of children who drank kerosene. One experienced no untoward effects, one went into an immediate collapse from which there was rapid recovery, one had considerable respiratory difficulty for eighteen hours with subsequent recovery, and one died.

REPORT OF CASES

CASE 1.—B. J., a colored girl, aged 1 year, while playing around the house found a tin can containing kerosene, from which she drank. Crying and a slight coughing attracted the mother's attention, and the child was brought to the hospital. On admission, an hour later, the baby appeared to be perfectly normal. The pulse was good, the respirations were normal, there was no evidence of cyanosis, and no burning of the mouth or throat. The stomach was washed out and the gastric content showed considerable kerosene. A laxative was administered. The subsequent course was uneventful and the child seemed to have no ill effects whatever from her drinking episode.

CASE 2.—H. M., a white boy, aged 2 years, while playing on the beach, where the family was spending the summer, found a bottle containing kerosene and drank from it. His coughing attracted attention. Within ten minutes he had gone into a state of collapse. There was no doctor in the community and a trained nurse staying near by rendered first aid. The stomach was washed out and magnesia magma was administered through the tube. At that time the skin was cold and clammy, the lips cyanotic, the pulse weak, and the child was in coma. An immediate start was made for the hospital, a three hours' drive.

By the time of admission, the child had regained consciousness. The pulse was rapid but strong, the respirations were slightly labored, and there was a mild degree of cyanosis. Caffeine was administered and external heat applied. Within twelve hours the child appeared to have recovered entirely, the pulse was normal, and normal color had returned. He was kept under observation for thirty-six hours and discharged in excellent condition. No further trouble ensued.

CASE 3.—P. H., a white boy, aged 18 months, while playing in the yard of a neighbor, picked up a tin cup containing kerosene and drank from it. Just how much of the fluid was swallowed is not known, although he probably took two or three mouthfuls. Rather severe coughing attracted attention and he was taken to the office of the family physician immediately. There his stomach was washed out and magnesia magma was given. The baby seemed somewhat sleepy following this procedure and the breathing was labored, so he was brought to the hospital.

On admission the child was stuporous. The lips were somewhat cherry red, and the breathing was stertorous and more labored than normal. The mouth and throat showed signs of a mild irritation. The pulse rate was accelerated but of good volume. The lungs were clear throughout to percussion and auscultation.

The child was kept under observation. The temperature gradually rose, and seven hours after admission it had reached 102.2 F. The breathing became more labored, although there was no indication on examination of any trouble in the lungs. The symptoms subsided rapidly, however, and within eighteen hours the temperature was normal, the breathing was natural and the child frolicked and played in his usual manner. He was discharged and showed no ill effects from his recent gastronomic indiscretion.

CASE 4.—L. M., a white boy, aged 11 months, while playing around the house one afternoon, picked up a container holding kerosene and started to drink. Immediately he began to cough and attracted the attention of the nurse. He was rushed to the office of the family physician, where sweet cream was given, followed by an emetic. The child vomited and the stomach contents were carefully examined, but little kerosene was found. An hour later he was moved to a hospital in a neighboring town. The stomach was washed out. The child was in a state of mild collapse, but following the administration of caffeine and atropine, normal color was restored, although the child was still very restless and was having difficulty with respiration. There was little change during the night. The following morning the child refused fluids by mouth, so rectal feeding was attempted, but unsuccessfully. Dextrose solution was given intravenously. By noon the child had become very restless and somewhat cyanotic; codeine was used as a sedative. Dextrose was given intravenously during the afternoon, and hot sponges were used to stimulate the peripheral circulation.

At 3 o'clock the next morning there was a sudden change for the worse. The house physician was called and found a crackling subcutaneous emphysema over the entire chest wall and neck. The respirations had become a great deal more labored. Moist râles were heard over the entire left chest. In spite of all stimulation, the child became weaker and weaker. I saw the child in consultation during the afternoon, at which time he was breathing his last. The pulse was rapid and weak, the lips and extremities were cyanotic. A crackling subcutaneous emphysema could be felt over the entire upper chest and lower neck. The respirations were gasping in type, and moist râles could be heard over the entire left chest. The baby died within half an hour.

Unfortunately, consent for autopsy could not be obtained. The body, however, was examined under the fluoroscope. Both lungs were filled with splotchy shadows, apparently a terminal bronchopneumonia. There was a pneumothorax approximately 2 inches in width between the left lower lobe and the diaphragm.

COMMENT

From these four cases it can be seen that there is no constant picture accompanying the drinking of kerosene. One factor that must be taken into account, as pointed out by Sollmann,[1] is the toxicity of the ingested kerosene, for the toxicity will vary directly in proportion to its content of volatile products. Thus, in case 1 the kerosene must have been of very low toxic nature as compared with that in case 2. In the first case there was an interval of an hour following the drinking before any treatment was attempted, and at the end of that time kerosene was still present in the stomach, yet there were no untoward effects. In the second case, collapse ensued within ten minutes.

A second factor that must be considered, one that plays a major part in determining the prognosis, is the amount of kerosene that is aspirated during the act of drinking. Poisoning directly by inhalation has been for the most part indus-

1. Sollmann, T. H.: Manual of Pharmacology, ed. 3, 1926.

trial or accidental[2] and has occurred in adults. The involvement of the respiratory tract in children (cases 3 and 4) is undoubtedly through aspiration of the liquid with vaporization following as the kerosene is warmed by the heat of the body. Although the boiling point of kerosene is between 150 and 300 C., at body temperature the lower hydrocarbons, which are present in all but the purest kerosenes, probably vaporize and produce damage. Although I can find no previous discussion of this phase of the poisoning, I can see no other method of explaining the lung involvement except in terms of primary aspiration with secondary irritation of the respiratory tract from the kerosene itself and from the vaporization of the lower hydrocarbons. In case 3 there was irritation of the larynx and probably of the upper trachea; this, I believe, was due to the local action of the kerosene. In case 4 there was in addition a terminal involvement of the lungs, which must have been caused by the vaporized volatile lower hydrocarbons.

The pathologic changes in the fatal cases vary.[3] In some cases reported the postmortem examination has been practically negative; in other cases there has been hyperemia and small hemorrhages in the gastro-intestinal tract and slight changes in the kidneys; also hemorrhages into the lungs and some hemolysis have been described. It is unfortunate that no autopsy could be obtained in case 4, in which there was evidently a terminal bronchopneumonia. I am unable to explain the pneumothorax and subcutaneous emphysema in this case. Whether the rupture was produced by coughing or by direct action of the volatile substances it is impossible to say, although the latter method would seem highly improbable.

The symptoms are variable, depending on the type and amount of kerosene taken, and may be divided into three groups: symptoms following the ingestion of the poison, those associated with inhalation, and those which follow aspiration, although these groups of symptoms will naturally overlap in some cases.

When kerosene is ingested, the first symptoms are those of irritation of the alimentary tract, burning pain in the mouth, throat and stomach, colicky pains in the abdomen, vomiting, thirst, and later painful micturition. If there are many volatile products in the kerosene and they become absorbed, more serious symptoms develop: drowsiness, cyanosis, shallow respiration, feeble pulse and coma. These more severe manifestations of the poisoning may come on within a short time (case 2). Fortunately, death is rare. Barbour[4] has stressed the presence of a bright cherry red color of the lips in these cases, a condition which I observed in one of my cases. He also found that the blood spectrum showed methemoglobin.

In those patients, usually adults, who absorb the poison through inhalation, the symptoms "resemble those of mild alcoholic intoxication, constituting the so-called 'naphtha jag,' lack of self-control being a prominent symptom, and excitement. These effects are followed by depression, headache, nausea, roaring in the ears, irritation in the throat, trembling in the hands and arms. In the more severe cases, signs of respiratory failure appear, the patients become pale, the lips livid, respiration slow, heart weak and feeble, followed by insensibility, convulsions, and death from respiratory failure."[2]

The third group of symptoms are those found in patients who aspirate the fluid. The course of events is probably as follows: The person drinking the fluid feels a burning sensation in the mouth and throat. Spitting, gasping and coughing follow, during which a certain amount, large or small as the case may be, is aspirated. If some of the liquid is swallowed, the symptoms described may ensue. The aspirated fluid sets up a local irritation of the epiglottis, larynx and trachea, with resulting difficulty to respiration. Through direct extension of the kerosene or through the action of the volatilized products, the irritation may extend down into the lung, resulting in a generalized congestion of the lungs and probably bronchopneumonia, with the usual symptoms of these conditions.

The diagnosis can be made only from the history, from the smell of kerosene on the breath, or from the presence of demonstrable kerosene in the gastric content.

The treatment is unsatisfactory. There is no known antidote for kerosene. The stomach should be washed out at once and a mild laxative administered. Otherwise the treatment is symptomatic. Stimulants should be used freely when indicated. The patient should be kept under close observation for at least twenty-four hours, and any symptoms of involvement of the gastro-intestinal or respiratory tracts and of the central nervous system carefully noted. In severe cases Barbour[4] suggests blood letting and blood transfusion to rid the body of methemoglobin.

2. Webster: Legal Medicine and Toxicology, Philadelphia, W. B. Saunders Company, 1930.

3. Gasoline (Petroleum Benzin) and Kerosene (Coal Oil) Poisoning in Children, Queries and Minor Notes, J. A. M. A. **89**: 1169 (Oct. 1) 1927.

4. Barbour, Orville: Kerosene Poisoning, J. A. M. A. **87**: 488 (Aug. 14) 1926.

Special Article

VITAMIN D

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CHICAGO

[EDITORIAL NOTE.—The following article is one of a series on the Present Status of the Knowledge of Vitamins, prepared under the auspices of a committee composed of Morris Fishbein, chairman, Lafayette B. Mendel and Julius Hess, representing a joint committee of the Council on Pharmacy and Chemistry and the Committee on Foods. These articles have been considered by the Council on Pharmacy and Chemistry and by the Committee on Foods and are published under their auspices. The opinions expressed are those of the authors and not necessarily the opinions of the Council on Pharmacy and Chemistry or the Committee on Foods.

A summation of the advance in knowledge of vitamin C was contained in a paper by Dr. Alfred F. Hess published in THE JOURNAL, April 23, page 1429, which paper was a part of this series.]

The discovery of the fourth vitamin, vitamin D, has been of the greatest importance to the medical profession as well as to mankind, because it has brought about the solution of the century-old problem of the cause and prevention of rickets. Today, because of this discovery, severe rickets, in civilized countries at least, is coming to be a rare disease. The opinion has even been expressed that within the next decade, or even sooner, the disease in all its forms may be almost completely eradicated; that it will become as rare as has infantile scurvy since the widespread use of orange juice.

To the English physiologist Mellanby belongs the credit of the discovery of the specific antirachitic factor or vitamin. His reports, published in 1918 and 1919, contain the first accounts of the undoubted production of true rickets in an experimental animal—in this case the dog—and of its cure by dietary means.

On diets consisting chiefly of cereal and small quantities of whole or skim milk, diets which are now recognized as deficient in vitamin D and also in calcium, there developed in Mellanby's puppies soft bones, bowed legs and other typical deformities seen in rachitic children. More definite proof of the presence of true rickets was obtained from roentgenograms and from chemical analysis of the dogs' bones, which were found to have a decidedly low calcium content. When a few cubic centimeters of cod liver oil was added to the diet, rickets failed to appear. Comparatively large amounts of butter fat and suet prevented it to some degree, but lard, cottonseed, olive and inseed oils proved entirely ineffective. Here was proof positive that the cause of rickets was to be found in a definite deficiency in the diet and that the cure lay in the addition of certain specific foods to the ration.

DISTINCTION BETWEEN VITAMINS A AND D

Since the fats that were most potent in the prevention of rickets, cod liver oil and butter fat, were also rich sources of the already known vitamin A, Mellanby

drew the conclusion that the antirachitic factor was probably identical with fat-soluble A. But because of certain conflicting experimental results of their own, American investigators were not willing to accept this interpretation, and in 1922 McCollum and his co-workers at Johns Hopkins University published definite proof of the existence of two separate and distinct fat-soluble vitamins. Taking advantage of the fact, already established by Hopkins in England, that vitamin A is readily oxidized, McCollum and his associates passed a stream of oxygen through cod liver oil which was held at the temperature of boiling water for from twelve to fourteen hours. At the end of this time they found that the oil still retained its antirachitic potency when fed to rats but had lost its power to cure xerophthalmia; in other words, it still contained the antirachitic factor but had lost its vitamin A. This antirachitic factor McCollum named vitamin D.

RELATION OF VITAMIN D TO ULTRAVIOLET RAYS

For a number of years there had existed a more or less vague opinion that the incidence of rickets was in some way connected with sunshine, fresh air and other hygienic factors in the child's environment. That ultraviolet radiation constituted a specific cure for rickets, however, was first definitely established by Huldschinsky, a German physician working in Berlin during and directly after the World War.

For some time scientists were puzzled to reconcile these two discoveries, that of a specific antirachitic factor in the food and that of the antirachitic action of ultraviolet rays. But the riddle was solved independently and almost simultaneously by Hess of New York and by Steenbock of Wisconsin, who announced in 1924 that antirachitic potency could be developed in a number of different biologic materials by exposure to the rays of a mercury vapor quartz or a carbon arc lamp.

Further investigation developed the fact that the substance in the food or other material which was activated by ultraviolet radiation was not a fat but a substance associated with fats, an obscure sterol called ergosterol. Up to this time this sterol was but little known and had been considered to have no biologic significance. Later work has shown that ergosterol has a wide distribution in plant and animal tissues, although it is usually found in minute quantities only, considerably less than 1 per cent. It is found in larger amounts in ergot, from which it gets its name, and in yeast. These two plants now constitute the chief commercial source of supply. Particularly interesting is the discovery that ergosterol exists in minute but measurable quantities in blood and in human skin. Kuester and Horth have recovered about 1.5 mg. of ergosterol per liter from the blood of a steer, and Hentschel and Schindel report that the sterols obtained from human adult skin contain 0.42 per cent of ergosterol, while those from infant skin contain 0.15 per cent.

The probable explanation of the antirachitic action of ultraviolet radiation is that the radiation forms vitamin D from the ergosterol in the skin. The vitamin is then absorbed into the blood and carried to the tissues where it is needed. Such an explanation is supported by several lines of evidence. In the first place, Hess, in 1925, showed that skin, both human and calf, though originally inert, could be made highly active by irradiation with ultraviolet rays. That vitamin D could be absorbed through the skin was shown by Hume, Lucas and Smith, who removed the hair on small areas on the bodies of rabbits and rats, and painted them with irradiated cholesterol, which is now known to contain irradiated ergosterol. The areas selected were inaccessible to the animals and were further protected by a chamois jacket which kept the animals from getting the irradiated substance into the mouth. Enough vitamin D was absorbed through these areas to protect the animals from rickets, although they were fed a severe rickets-producing diet.

Other work with rachitic babies has shown that massaging the skin with cod liver oil or with irradiated oil may bring about a cure.

It is possible that the ultraviolet rays may penetrate the skin sufficiently to reach the ergosterol in the capillary blood. However, a recent report from China indicates that in all probability the activation of ergosterol takes place in the skin and not in the blood. In the experiment reported, it was found that rachitic rats could be cured by the irradiation of a small area of shaved skin on the back, or of the outer surface of the normal ear. If the skin surface was thoroughly cleaned with ether immediately before the irradiation, however, only slight healing took place. Also, if the blood circulating in the vessels of the ear was exposed to the ultraviolet rays, healing did not occur. This, Hou believes, is strong evidence that the seat of activation is the sebaceous secretion of the skin.

In this connection, it should be mentioned that pigmentation of the skin reduces its permeability. Macht found that Negro skin is less permeable than white, and Hess found that black rats required more ultraviolet radiation to protect them from rickets than white ones. But both Negro babies and black rats can be protected from rickets by ultraviolet radiation if it is of sufficient intensity.

INFLUENCE OF VITAMIN D ON CALCIUM AND PHOSPHORUS METABOLISM

The exact method by which vitamin D exerts its influence on calcium and phosphorus metabolism is by no means clearly understood. Nevertheless, some of its effects on certain broad phases of mineral metabolism are well recognized. Among these are the retention of calcium and phosphorus in the body as a whole, the concentration of calcium and phosphorus in the blood, and the deposition of calcium and phosphorus in the bones.

Calcium and Phosphorus Retention.—Unquestionably, one of the effects of small or moderate amounts of the antirachitic factor is to increase the amount of calcium and phosphorus retained in the body on any given diet. This fact has been established by many so-called balance experiments, the purpose of which is to compare or balance the intake of the two minerals against the total output of each. Such experiments have been carried out both on children and on animals and are too numerous to quote in detail, but certain outstanding results may be referred to.

The great majority of balance studies on rachitic children were carried out in Germany prior to the World War. The results of these studies show that the rachitic infant stores much less calcium and phosphorus in his body than does the normal child.

That cod liver oil might bring about a remarkable improvement in the mineral balance, that is, greatly increase the amount of calcium and phosphorus stored by the baby with rickets, was demonstrated by Schabad

more than twenty years ago, several years before Mellanby's discovery of the antirachitic factor. In the particular case studied, the calcium balance was increased from + 0.067 to + 0.465 Gm. of calcium oxide, and from + 0.116 to + 0.417 Gm. of phosphorus pentoxide when cod liver oil was given.

More recently, Orr, Holt, Wilkins and Boone have observed that the mineral retention of rachitic children could be greatly increased either by treating them with light from a mercury vapor quartz lamp or by feeding them irradiated milk.

More important for the average child is the fact that normal, that is, nonrachitic, infants will also store more calcium and phosphorus when cod liver oil or some other source of vitamin D is fed. Within recent years a series of seventy-four metabolism experiments has been carried out on apparently normal, but artificially fed, infants by Dr. Amy Daniels of the Child Welfare Research Station and the Pediatric Department of the University of Iowa. In every case, Dr. Daniels found that both calcium and phosphorus retention were greatly improved by cod liver oil, irradiated milk or irradiated olive oil. A few typical results selected from her very complete tables are given in table 1:

TABLE 1.—*Calcium and Phosphorus Retention in Nonrachitic Infants on Cow's Milk Mixtures, With and Without Added Vitamin D*

Children			Calcium			Phosphorus		
				Retention			Retention	
Age, Mo.	Number	Type of Feeding	Intake, Gm.	Total Gm.	Per Kg. Gm.	Intake, Gm.	Total Gm.	Per Kg. Gm.
6	9	Pasteurized milk; no cod liver oil	0.89	0.025	0.0042	0.72	0.045	0.0075
4	4	Pasteurized milk plus cod liver oil	0.78	0.186	0.031	0.64	0.180	0.030
5	5	Irradiated milk plus cod liver oil	0.84	0.272	0.040	0.66	0.136	0.020
4	2	Irradiated olive oil	0.79	0.288	0.045	0.63	0.202	0.032

The experiments on children have received abundant confirmation in work on animals, including dogs, rats, goats and pigs. One of the most interesting of these experiments is that performed by Shohl and Bennett on dogs fed a diet similar to that used by Mellanby in his pioneer work. Two dogs in which severe rickets developed were found to be retaining considerably less than half of the calcium which they ate, while a third dog, which received the same diet with cod liver oil added, was keeping in its body more than three fourths of the calcium in its food.

The question "Why does vitamin D increase mineral retention?" is often asked but so far has not been satisfactorily answered. Since both calcium and phosphorus are excreted largely through the intestinal wall as well as through the kidney, it is difficult, if not impossible, to say whether the increased retention is due to an increased absorption of mineral or to a decreased excretion. A third possible factor might be the deposition of greater amounts of calcium and phosphorus in the bones. In all probability the vitamin does not exert its influence in any one direction but to some extent in all three directions.

Evidence for increased absorption lies in the fact that very large quantities of both calcium and phosphorus are found in the feces of rachitic children, while very small amounts are found in the urine. When vitamin D is given, the usual result for both rachitic and normal children is that much less of the mineral is found in the feces and more in the urine. The smaller amounts in the feces, however, might be the result of a lowered excretion as well as of an increased absorption.

Further evidence for increased absorption will be discussed in the next section.

Concentration of Calcium and Phosphorus in the Blood.—The power of the antirachitic factor to control the concentration of calcium or of phosphorus in the blood is now widely recognized. An early and important sign of rickets in babies is a low concentration of inorganic phosphorus in the blood, a concentration of 2 or 3 mg. per hundred cubic centimeters of serum instead of the normal 5 to 6 mg.

Treatment with cod liver oil, ultraviolet rays, irradiated ergosterol or any other of the antirachitic agents results in a prompt rise to normal values. In infantile tetany, which may accompany rickets or may occur spontaneously, the blood calcium is considerably diminished. In this disease, also, antirachitic treatment quickly restores the normal concentration of the blood.

Even nonrachitic babies show a seasonal variation in blood phosphorus which corresponds to differences in the amount of sunlight they receive. In the late spring and summer, when the babies are outdoors and the sunlight is rich in ultraviolet rays, the inorganic phosphorus is at its height. In the darker months of late fall, winter and early spring, when the sunlight contains little, if any, of the ultraviolet, the blood phosphorus may sink almost to rachitic levels.

One of the most recent and very striking demonstrations of the part played by vitamin D in the elevation of the blood phosphorus is the work of the German investigator Warkany. It is well known that the feeding of inorganic phosphates by mouth or their injection parenterally results in a temporary rise in the concentration of phosphorus in the blood. Warkany first measured the increase which could be produced in the blood of normal rabbits by feeding standardized doses of sodium diphosphate (0.5 Gm. per kilogram of body weight). The increase above fasting values, which proved to be surprisingly constant, reached its height in from one to three hours and from then on declined, until it had entirely disappeared in from six to seven hours. A very definite curve of phosphorus values could be drawn, which Warkany called the phosphatemic curve. When the rabbits were given rather large doses of irradiated ergosterol from twenty-four to forty-eight hours before the phosphate was fed, the average rise in blood phosphorus was doubled or, more often, trebled.

Nonrachitic babies reacted in the same way as the rabbits had done, showing approximately the same increase in blood phosphorus with equivalent doses of the sodium salt. Feeding inorganic phosphate to rachitic babies, however, resulted in practically no increase in the blood phosphorus until after antirachitic treatment was begun, when the phosphatemic reaction rapidly became normal or greater than normal.

In order to discover whether the blood calcium would be similarly influenced by irradiated ergosterol, Jones and Rapoport of the University of Pennsylvania School of Medicine have repeated Warkany's experiments on dogs, using standard doses of calcium salts

instead of the disodium phosphate. When a soluble calcium salt (calcium gluconate) was fed, 0.1 Gm. of calcium per kilogram of body weight produced only a slight rise in the blood calcium. After the dogs had been given irradiated ergosterol, however, the same amount of calcium salt produced a much greater rise in the blood calcium.

When calcium and phosphorus were fed together, in chemical combination as the insoluble dicalcium phosphate, the results were disappointing, because there was no marked increase in either calcium or phosphorus in the blood.

Conceivably, vitamin D might bring about increases in blood calcium and phosphorus either by increasing the absorption of minerals from the intestine or by decreasing excretion through the kidney or intestine, or both. Unfortunately, neither group of investigators has measured the calcium or phosphorus in the feces during the course of the experiments. Warkany, however, has measured the urinary phosphorus of rabbits simultaneously with the determination of the phosphatemic curve and finds that the urinary phosphorus is increased tenfold after irradiated ergosterol is given. He believes it highly unlikely that this phosphorus could have come from the tissues but thinks it must be the result of increased absorption from the tract.

That another mechanism must be involved, however, is indicated by the work of another German investigator, Heymann, who found that similar increases in the blood phosphorus occurred when irradiated ergosterol was given parenterally. Here, of course, the factor of intestinal absorption is eliminated. Evidently vitamin D increases the capacity of the blood to hold phosphorus, possibly by raising the level at which it begins to be excreted.

Relation of Calcium to Phosphorus in the Blood.—The Ca × P product: Certain investigators believe that the relation of calcium to phosphorus in the blood, or the calcium × phosphorus product, is more important from the standpoint of normal calcification of the bone than is the individual concentration of either one alone. Howland and Kramer, who first established average figures for blood calcium and phosphorus in both normal and rachitic children, believe that the relation between the two is of considerable significance.

Normal children or animals, with approximately 5 mg. of inorganic phosphorus and 10 mg. of calcium, have a calcium × phosphorus product of about 50. In rickets the product is almost always low. Kramer believes that a product under 30 always means active rickets, that healing begins when the product reaches 40 or above, and that healed rickets is usually characterized by products above 50.

Recently Kramer, with his associates Shear and Siegel, reported the results of an extended series of experiments which support this theory. This investigation included work with 350 rats in which the changes in the calcium × phosphorus product and the first evidences of calcification of the bone after antirachitic treatment was begun were very closely followed.

The rachitic rats all showed a calcium × phosphorus product of 27 or lower. In every case a marked rise in the product preceded the first evidences of new bone formation. Practically no healing took place until the product had reached 40 or above. In most cases the lowest value which accompained healing lay between 40 and 50.

These results are remarkably paralleled by observations of the calcification of rachitic cartilage when it is immersed in solutions made up of inorganic salts of the kind and concentration that are found in blood serum. When the calcium × phosphorus product of such solutions is 30 or less, calcium is not deposited in the tissue. When the product is 40 or more, calcification is regularly obtained in vitro in about nine hours.

Composition of Bone.—In the absence of vitamin D, bone is abnormal both in chemical composition and in histologic structure. Rachitic bones of children and animals have a total ash content and a calcium and phosphorus content considerably below the nonrachitic. Normal bones, for example, contain from 55 to 60 per cent of ash, but in rickets the ash content sinks to 30 per cent or lower. Singularly enough, the ratio of calcium to phosphorus remains unchanged, showing that if calcium and phosphorus are deposited at all they are deposited together in the usual chemical combination.

The ratio of ash to organic residue in the fat-free bone (A/R ratio) may, however, be considerably altered, the ash being low and the organic residue abnormally high. In a group of animals studied by Chick, Korenchevsky and Roscoe, the A/R ratio in the bones of young rats on a standard rickets-producing diet varied from 0.4 to 0.8, while in the bones of rats receiving the same diet plus cod liver oil the A/R ratio was 1.

Histologic Structure.—Deficient calcification results in abnormal histologic structure and in a characteristic roentgen picture. These must be mentioned here because of their widespread use in studying the effects, the distribution and the quantitative relationships of vitamin D.

Histologically the absence of calcification may be detected in either one of two ways—by means of the now famous line test, first suggested by McCollum and Shipley, or by the microscopic examination of partially decalcified bone, stained with hematoxylin. The theoretical explanation of the latter test is that tissue which has not been calcified will fail to take the stain, but Cameron in a recent study has shown that the method is open to serious criticism and that the results must be used with caution.

The line test is so delicate that very slight degrees of rickets or of healing can be detected by its use. It is therefore much used in quantitative estimations of vitamin D and is, in fact, the test on which the standard method of assay of viosterol (irradiated ergosterol) in the United States is based.

The principle underlying the test is that when bone sections are soaked in dilute solutions of silver nitrate, silver phosphate is formed in the areas where calcification has taken place, and this silver salt, when exposed to intense light, is reduced to black silver. A distinct dark line of calcification appears at the ends of normal bones, no line at all in severe rickets, and a more or less sharp line in cases of healing rickets, according to the degree of recovery. From the width and character of the line formed under standard conditions, the relative quantity of the antirachitic effect is judged.

Roentgenograms.—Evidence of imperfect calcification is also found in roentgenograms of the ends of the long bones. In children the ends of the bones, normally convex in outline, develop a frayed appearance and finally become "cupped" or concave instead of

convex. In severe rickets in rats the uncalcified area (metaphysis) between the diaphysis and the epiphysis, normally a thin, sharply defined line, widens into a broad and irregular band.

Although not quite so delicate as the line test, the roentgenogram will nevertheless detect the presence of very early stages of rickets or of slight degrees of healing. It therefore is also much used in quantitative work with vitamin D, the degree of antirachitic effect being judged by the width of the uncalcified metaphyseal band.

The roentgen method has the great advantage of allowing the investigator to follow the progress of healing in one and the same animal during life, which, of course, is impossible with the line test. According to Hess, a further benefit derived from the use of roentgenograms is that "In general, it has tended toward an appreciation of the labile nature of bone tissue, of its quick response to favorable or adverse influences and to overthrow of the time-worn conception of bone as a fixed and inert tissue."

BODILY STORAGE OF VITAMIN D

Individual differences in susceptibility to rickets have been frequently observed in experimental animals as well as in infants. The cause of the differences in experimental animals can usually be traced to the type of diet eaten by the mother during pregnancy and lactation. For example, as early as 1923, Hess and his associates discovered the disconcerting fact that a certain strain of rats, purchased from a dealer, were much more resistant to rickets than the rats that were raised in his own laboratory. Investigation showed that the stock diet on which the purchased animals were bred was rich in minerals and vitamins, considerably richer than that used in Hess's laboratory. When the nursing mothers were transferred to Hess's ration at the beginning of the lactation period, the resistance of the young rats disappeared.

Further striking proof that other young animals may be protected from rickets by the diet of the mother during pregnancy and lactation is furnished by a recent study made by the Toveruds of the University and the Dental School of Norway. As a part of this investigation it was found that if mother dogs were fed a diet lacking in minerals and fat-soluble vitamins during both pregnancy and lactation, their puppies were very susceptible to rickets, which would develop within three weeks after they were placed on the same deficient diet on which their mothers had been fed.

Other puppies, whose mother was fed the deficient diet during lactation only, required six weeks for the development of rickets, while in still others whose mothers were fed a normal diet throughout pregnancy and lactation the disease did not develop until the puppies themselves had been on the deficient diet for thirteen weeks.

Clearly, the more deficient the diet during pregnancy and lactation, the less vitamin D the puppies were able to store and the sooner they succumbed to the influence of the rickets-producing diet.

THE QUANTITATIVE DETERMINATION OF VITAMIN D

As yet, no chemical or physical methods for the quantitative determination of vitamin D have been developed. Neither has any one standard biologic method been agreed on. Points which are still to be decided are, first, whether a rickets-producing diet shall be used or whether a less drastic diet, deficient in vitamin D only, shall be employed. If a rickets-producing diet is used, which one of the standard diets shall be chosen? Shall rickets be prevented or shall it be allowed to develop and then be cured? What shall be the criterion for the judgment of the severity of the rickets, or of the degree of healing? Finally, how shall the unit of measurement be defined?

The various methods for quantitative determination which have been suggested will be discussed in the next section.

Production of Rickets in Rats.—For quantitative work with vitamin D the rat is exclusively used. Among the advantages which this animal offers is, first, the fact that it will readily develop the disease on a properly chosen diet. Two other important advantages are that it is small and therefore comparatively easily and inexpensively cared for in large numbers, and its short span of life makes accurate results possible within a reasonably short time.

In order to produce true rickets, the experimental diet must be abnormal in two respects: It must be deficient in vitamin D, and the relation between calcium and phosphorus must be abnormal, that is, must vary considerably from the ratio of 2 parts of calcium to 1 of phosphorus, which is found in normal bone. Diets

TABLE 2.—*Composition of Certain Standard Rickets-Producing Diets*

Sherman and Pappenheimer Diet 84	Per Cent	Steenbock Diet 2965	Per Cent	McCollum Diet 3143	Per Cent
Patent flour	95.0	Yellow corn	76	Whole wheat	33
Calcium lactate	2.9	Wheat gluten	20	Whole yellow corn	33
Sodium chloride	2.0	Calcium carbonate	3	Wheat gluten	15
Ferric citrate	0.1	Sodium chloride	1	Gelatin powder	15
				Calcium carbonate	3
Ca:P 6.5-1		Ca:P 4-1		Sodium chloride	1
				Ca:P 4-1	

in which the ratio of calcium to phosphorus is very high, 4 to 1 or higher, produce a type of rickets very similar to that usually found in babies. Low calcium-high phosphorus diets will also produce rickets, but of a different type, and are therefore much less commonly used.

In the United States three standard rickets-producing diets have been developed: Sherman and Pappenheimer's diet 84, McCollum's diet 3143 and Steenbock's diet 2965. The composition of these diets is given in table 2. They are all decidedly lacking in vitamin D and have a high calcium to phosphorus ratio. Although by no means ideal in other respects, they are sufficiently adequate to support growth and maintain a satisfactory state of nutrition for the short period of the experiment.

A fourth, more nearly adequate, diet has been suggested by Osborne and Mendel. Unlike the other standard diets, it is made up entirely of purified food substances. It contains a salt mixture which is entirely lacking in calcium and phosphorus, and any desired ratio between the two may be obtained by adding different amounts of their respective salts. This diet, although promising, has not so far gained any wide use.

A further requirement for the production of rickets in experimental animals is that they be kept away from the direct sunlight. They are therefore kept in rooms

which either receive no daylight at all or have the only daylight coming through window glass.

Curative vs. Preventive Methods.—Measurements of antirachitic potency may be made either in terms of the minimum quantity of a given substance needed to prevent rickets or in terms of the minimum quantity of the same substance needed to produce a definite degree of healing. Each method has its advocates and each is widely used. Results in the preventive type of experiment seem to be somewhat more clear cut and less of the vitamin appears to be needed for prevention than for cure. Nevertheless, up to the present time, the curative method appears to have been used by the majority of investigators.

Diagnosis of Rickets.—The diagnosis of rickets in rats is dependent on a number of laboratory tests, two or more frequently being made as checks against one another. During the life of the rat the investigator is dependent chiefly on roentgenograms. After death, gross deformities of the skeleton may be observed, the blood or bones may be analyzed for calcium or phosphorus, or the bones may be examined histologically, either by means of the line test or by staining with hematoxylin after partial decalcification with Müller's fluid. For exact quantitative work the line test, roentgenograms and the chemical analysis of the bones appear to be the most suitable.

Quantitative Use of the Line Test.—In the United States the line test has formed the basis of the majority of quantitative determinations of vitamin D. The test has been developed to a very high degree of precision by Bills and his associates in the research laboratories of Mead Johnson & Co.

Because of the differences in the quantity of vitamin D which may be stored by young rats whose mothers have received different amounts of the vitamin during pregnancy and lactation, it is essential that the animals used for quantitative assay be bred on a uniform stock diet, not too high in vitamin D. According to the procedure of Bills, which is curative in nature, the young rats, bred on such a ration, are removed, immediately after weaning, to a room in which all daylight, even that filtered through window glass, is excluded. They are kept there from eighteen to twenty-four days on McCollum's diet 3143. They are judged to be ready for the test when a palpable enlargement of the wrists and a slightly waddling gait has developed.

The material to be tested is incorporated into the rickets-producing diet and administered for exactly five days, an individual daily food consumption record being kept. Each rat must eat a definite amount (from 2 to 4 Gm. daily) and must not lose weight, because a loss of weight, possibly due to the liberation of phosphorus from the tissues, may occasionally of itself cause calcification.

At the end of five days the animal is killed and the line test made. Four degrees of healing are recognized, indicated by from one to four plus signs.

As in all biologic work, the number of rats used in any given assay greatly influences its accuracy. When 100 rats were used, Bills estimated the probable error to be about 4 per cent. With 50 rats it was from 6 to 7 per cent, and with 4 rats, 31 per cent. More than 100 rats do not appear to be needed, even for the most precise determinations, since increasing the number beyond this point did not greatly increase the accuracy of the test.

Quantitative Use of Roentgenograms.—A certain amount of individual variation in susceptibility to rickets occurs even among animals of the same litter, whose ancestors have been bred on the same diet for generations. When the line test is used, it is assumed that in all the animals selected for the test rickets has developed to the same degree. Without individual examination, however, one cannot be absolutely certain that this is the case. For this reason, a large group of investigators prefer the roentgen test, first suggested by Poulsson and Lövenskiold of the Pharmaceutic Institute of the University of Oslo.

The details of the application of this test may vary slightly according to the investigator who uses it. In general, however, young rats are kept on either the McCollum or the Steenbock diet for a period of two or three weeks, until they have developed very severe rickets. At the end of this period, roentgenograms of the knee joints are taken. The substance to be tested is then fed in graded amounts to different groups of animals. At the end of one, two or three weeks the rats are again roentgenographed and the photographs compared.

Comparative Accuracy of the Line Test and Roentgen Methods.—In general, the line test and the roentgen method, when used on the same animal, give results that are identical or very nearly so. However, the line test is considered somewhat more delicate, since it will detect very early stages of healing which are not visible on a roentgenogram. It will also detect the cases of atypical healing that occasionally occur.

Chemical Analysis of the Bones: Measurements Made on Diets Deficient in Vitamin D Only.—On diets deficient in vitamin D but having a normal calcium and phosphorus content, true rickets, as judged by histologic examination of the bones, does not appear. Nevertheless, on such diets the bones are abnormally low in calcium content and will respond to graded allowances of vitamin D by corresponding increases in calcium.

So close is the relationship between the quantity of vitamin D in the diet and the amount of calcium in the bone that Sherman and Stiebeling have suggested the chemical analysis of the bones as a basis for the quantitative determination of vitamin D when it is desired to employ a diet adequate except for the vitamin. The technic which they recommend is the following:

Young rats, from 21 to 28 days old, are placed on a diet comparable to that used in the determination of other vitamins. Sherman and Stiebeling's diet consists of purified casein 18 per cent, cornstarch 66 per cent, Osborne and Mendel salt mixture 4 per cent, dried brewers' yeast 10 per cent, sodium chloride 1 per cent and dried powdered spinach 1 per cent. The spinach is used because it is rich in vitamin A but practically devoid of vitamin D. The animals are kept in semidarkness in rooms lighted through glass.

One or more of each litter of animals used is kept on this basal diet without supplement (negative control); another (positive control) is given an abundance of vitamin D. Still others are fed graded allowances of the food under investigation. Since Sherman and Stiebeling have found that the bones of animals from different litters, even on the same diet, do not have exactly the same calcium content, they state that it is important to have members of the same litter in all groups. They also state that probably animals from at least five or more litters should be used in each group.

After twenty days, the test is terminated, the rats are killed and the femurs are analyzed. Those amounts of the material under investigation which induce a degree of calcification midway between the maximum and the minimum values obtained with the positive and negative controls are considered to have equivalent amounts of vitamin D.

This method is so new that no other reports of its use are available. However, since it furnishes a means of measuring small amounts of vitamin D in foods which have hitherto been considered poor sources of the vitamin, it would appear destined to have a wide use.

STANDARDIZATION OF IRRADIATED ERGOSTEROL AND COD LIVER OIL

The adoption of a unit of measure that will express differences in antirachitic potency in numerical terms if possible is highly important, particularly for the standardization of cod liver oil and irradiated ergosterol which are to be used medicinally. But the definition of such a unit involves a number of variables, and no entirely satisfactory statement has yet been made. In the first place, no agreement has yet been reached as to whether the rat unit should be that amount of an antirachitic substance which when fed to rachitic rats will just suffice to cure them or will just suffice to protect them from rickets. Further points that remain to be agreed on are a single method for quantitative determination, a satisfactory standard to which antirachitic potency may be referred, and whether the unit shall be expressed in terms of the minimum total quantity of antirachitic substance needed to cure rickets, or as the minimum daily dose.

The American Unit.—In the United States the Council on Pharmacy and Chemistry of the American Medical Association has accepted the rat unit proposed by the Wisconsin Alumni Research Foundation (Steenbock) for the standardization of irradiated ergosterol. This unit is defined as "that amount of vitamin D which, when uniformly distributed into the standard vitamin D deficient diet—ration 2965, *J. Biol. Chem.* 64: 263, 1925—will produce a narrow and continuous line of calcium deposits on the metaphysis of the distal end of the radii and ulnae of standard rachitic rats." In this instance the line test and the Steenbock diet are taken as standards.

Viosterol (irradiated ergosterol) is standardized by comparison with a "potent cod liver oil," which is defined as one that contains 13.33 rat units per gram, or one rat unit in every 75 mg. of oil. This 75 mg. of oil, it should be noted, does not constitute the minimum daily dose but is the total quantity of oil to be given during the entire period of the experiment, from six to ten days, the exact length of the period depending on the food consumption of the individual rats.

The British Unit.—The British Medical Research Council objects to the standardization of irradiated ergosterol in terms of cod liver oil because of the variation in potency of different samples of the oil and because of the variation in response to equal doses of any antirachitic material that may be shown by apparently similar animals when tested at different seasons of the year or bred in different laboratories.

They propose to avoid these difficulties by using a standard solution of irradiated ergosterol made under accurately recorded and controlled conditions and adjusted to a known standard concentration. In any individual assay of an unknown material they recommend that the rats be fed in pairs, one member of each pair being given the unknown material and one the standard preparation. The response of any given group of rats to the two preparations is therefore simultaneously observed.

The council further suggests:

That the unit of vitamin D be defined as the antirachitic potency of a quantity of this preparation corresponding to 0.0001 mg. of the ergosterol used in its preparation.

That either the x-ray method, the "line test" or the chemical analysis of the bones of the experimental animals be recommended for use in the estimation of vitamin D.

That supplies of the standard material be made available for general distribution from the National Institute for Medical Research, Hampstead. As the supply is limited it is hoped that users will themselves prepare standard solutions of irradiated ergosterol for use in individual tests, retaining the National Institute's material for reference. It is important that all such standard materials be kept at temperatures not exceeding 0 C.

Other Units.—In addition to those units which have been recognized by authoritative bodies in this country and in England, a number of others have been suggested and used in various scientific and commercial laboratories.

For example, Poulsson has suggested the use of a unit analogous to that adopted by the American Pharmaceutical Association for the measurement of vitamin A. This unit is defined as the minimum daily dose which, given over a period of six days, will cure a severe rickets.

In Germany the unit used by Windaus and his associates and by the firms dispensing Vigantol, the German equivalent of viosterol, is defined as that amount of active substance which exactly suffices to protect, with certainty, young growing rats from rickets.

Because of this multiplicity of units, Bills prefers to express the potency of vitamin D preparations in terms of their "cod liver oil coefficient," the potency of average cod liver oil being taken as the standard.

Standardization of Viosterol.—In the United States, as already noted, the Steenbock unit has been accepted as the basis for the standardization of viosterol.

Viosterol prepartions as now accepted by the Council on Pharmacy and Chemistry have a potency of 250 D, that is, 250 times the vitamin D potency of the standard cod liver oil defined by Steenbock. Cod liver oil which has viosterol added to it has a potency of 10 D.

In order to insure the manufacture of a uniform product, the Wisconsin Alumni Foundation has supplied each of the manufacturers operating under its licenses with a preparation of viosterol in oil 250 D to be used as a control for their respective products. Firms which are licensed by the Foundation are the Abbot Laboratories, Mead Johnson & Co., Parke, Davis & Co., and E. R. Squibb & Sons.

Standardization of Cod Liver Oil.—As yet, no standard method for the assay of cod liver oil for vitamin D has been adopted. The result is that different methods are used in different laboratories, and widely differing statements of antirachitic potency are to be found on the labels of the commercial products. A few firms merely state that their oil is of tested antirachitic potency. Others state the numbers of units per gram or per ounce, but since they do not define the unit used, their statements do not convey much real information.

It is to be hoped that the next issue of the Pharmacopeia (U. S. P. XI) will contain a method of assay for the antirachitic potency of cod liver oil. It has been suggested that such a method should require a uniform method of labeling, preferably in terms of units per gram of oil, and should not permit statements of numbers of units per ounce or any multiple of 1 Gm. or any fraction thereof, since such statements only add to the confusion in the minds of the public.

FORMATION OF VITAMIN D BY ULTRAVIOLET RADIATION

Ergosterol as the Provitamin.—As has been pointed out, the chief substance which assumes antirachitic potency on irradiation is a formerly little known sterol, ergosterol. Although a number of other similar compounds are known and have been investigated, none, with the possible exception of cholesterol, have ever acquired antirachitic potency. Cholesterol, if it can be activated at all, becomes only weakly antirachitic when compared with ergosterol. The latter may therefore be regarded as certainly the most important, if not the only, provitamin.

Wavelengths of Light: The Spectrum.—As is well known, sunlight passing through a quartz prism is broken up into the familiar color spectrum made up of radiations of different wavelengths. Only part of the spectrum is visible. The visible part, ranging from red to violet, consists of radiations measuring from about 800 millimicrons at the red end to 390 millimicrons at the violet. Longer than 800 millimicrons are the infra-red or heat rays, recognized by their heating effect when a blackened thermometer bulb is placed at their end of the spectrum. At the other end of the spectrum, shorter than 390 millimicrons, are the invisible ultraviolet rays, which are recognized by their chemical action on a photographic plate and are sometimes called the chemical or actinic rays. Very much shorter, but usually thought of as part of the same continuous spectrum, are the powerful x-rays. A number of important figures on the wavelengths of light will be found in table 3.

TABLE 3.—*Significant Figures of Wavelengths of Light*

	Millimicrons
Visible light	770–390
Ultraviolet	390–185
Wavelengths with greatest antirachitic potency	302–265
Longest wavelength with antirachitic potency	313
Shortest wavelength passing through window glass	320
Shortest wavelength in summer sunshine	290
Shortest wavelength in May sunlight in Chicago	299
Shortest wavelength in December sunlight in Chicago	305
Shortest wavelength from mercury quartz lamp	185

Ultraviolet Rays Responsible for Antirachitic Potency.—Early work by Hess and Weinstock established the fact that ultraviolet rays, to have antirachitic potency "must have a wavelength not longer than 302 or possibly 313 millimicrons." Further work by Hess and Anderson and by Griffith and Spence has shown that light of wavelengths between 302 and 280 was highly potent, but that wavelengths of 265 millimicrons were much less effective.

Recently Marshall and Knudson have shown that ergosterol can be activated by wavelengths shorter than 265 millimicrons but that the potency of the product is, in the beginning at least, directly proportional to the amount of energy absorbed; that is, to the intensity of the light received. When the very short wavelengths, of 230 millimicrons or less, are isolated from the spectrum of a mercury vapor quartz lamp, the intensity is so low that weeks or months of irradiation would be required to prepare a potent product.

Potency of Irradiated Products.—The potency of various preparations of irradiated ergosterol is known to vary enormously, and the maximum limit of activity has perhaps never been reached. The English standard preparation, irradiated in alcohol, is effective in daily doses of 0.0001 mg., but products which show antirachitic potency in doses as small as 0.00002 mg. have been prepared. Compared with cod liver oil, the potency may range from 200,000 or less to 700,000 or more times that of average oil. Commercial preparations of viosterol, with a potency of only 250 times that of a standard cod liver oil, are of course much below the maximum and are much diluted before they are marketed.

Variations in the potency of the irradiated products appear to be caused by the medium in which the ergosterol is irradiated, by the intensity and the wavelength of the light used, and by the duration of the irradiation. It is believed that better results are obtained if all traces of oxygen are removed from the apparatus and from the solution before it is irradiated, but a very active product may still be prepared in the presence of considerable amounts of oxygen.

Influence of Solvent.—Ergosterol may be irradiated dry or dissolved in any one of a number of solvents; for example, alcohol, ether, hexane, benzene and various oils. The same degree of potency, however, is not obtained in the different solvents. The potency of ergosterol irradiated in oil is generally believed to be low, but in a recent article by Bills, Honeywell and Cox the statement is made that ergosterol dissolved in arachis oil can be made to attain a cod liver oil coefficient of about 200,000.

In the same article it is reported that ergosterol irradiated in ether developed nearly three times the potency of that irradiated in alcohol—a cod liver oil coefficient of 710,000 in ether compared with 250,000 in alcohol. The authors have no explanation for this phenomenon, which, for the present, for lack of a better term, they call a specific solvent effect.

Overirradiation.—Experience has shown that vitamin D is itself sensitive to ultraviolet radiation and is finally destroyed by it. The solvent seems to determine the rate of destruction as well as the rate of formation, for when alcohol is used as the solvent the potency entirely disappears after three and one-half hours of irradiation, while when ether is used more than eighteen hours is required for complete destruction.

OTHER METHODS FOR THE FORMATION OF VITAMIN D

It is becoming clear that ergosterol may be activated by other means than by irradiation with ultraviolet rays. Several investigators have reported the preparation of potent products by means of irradiation with x-rays and also with radon. One Japanese report states that an active product has been prepared by treatment with ozone, and Bills, in a recent publication, reports that he is now using a new preparation of vitamin D prepared chemically without the agency of ultraviolet rays. He does not give the details of his method at this time, however.

(To be continued)

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

W. A. PUCKNER, Secretary.

FISSAN POWDER, FISSAN SWEAT ABSORBING POWDER, FISSAN OINTMENT, FISSAN LOTION, FISSAN OIL, FISSAN SULPHUR POWDER, FISSAN OINTMENT-R, AND FISSAN SOAP NOT ACCEPTABLE FOR N. N. R.

As "Labile Milk Albumin Preparations," Walter Lehn, Clifton, N. J., offers a line of "Fissan" preparations which are put out by the Deutsche Milchwerke A. G., Zwingenberg-Hessen, Germany. All are stated to contain as an important constituent some derivative of casein which is inadequately defined.

Fissan Powder is stated to be composed of "Fissan Hydrogel I" ("Labile milk albumin" 0.8 per cent, "Colloidal silicates" 2.25 per cent, zinc oxide 5.3 per cent, "organic fat emulsion" 0.4 per cent) 8.75 per cent, bismuth subnitrate 0.75 per cent, "white bolus" 4 per cent, boric acid 3 per cent, rice starch 10.13 per cent, talc 73.37 per cent. It is stated that "the basis of Fissan Powder is incinerated diatomeae of enormous absorptive power which receives a very fine coating of the highly voluminous Fissan colloid and is combined with the labile milk albumin at blood temperature under physiological conditions." It is asserted that Fissan Powder brings about "quick absorption of wound secretions, killing of germs and therapeutic effect due to the contents of labile milk albumin."

Fissan Sweat Absorbing Powder is stated to be composed of "Fissan Hydrogel II" ("labile milk albumin" 0.8 per cent, "organic fat emulsion" 0.4 per cent, "colloidal silicates" 26.7 per cent, zinc oxide 5.15 per cent) 33.05 per cent, bismuth subnitrate 0.5 per cent, "white bolus" 2.47 per cent, boric acid 1.98 per cent, rice starch 10 per cent, talc 51 per cent, alum 0.5 per cent, salicylic acid 0.5 per cent. The preparation is recommended by the distributor for "hyperhidrosis of the hands, feet and axillae, dry vaginal treatment in fluor albus (leucorrhea) even in severe chronic cases. Highly efficient in various tropical diseases especially Lichen tropicus, Miliaria."

Fissan Ointment is stated to be composed of "Fissan Hydrosol (bismuth subnitrate 0.5 per cent, "white bolus" 3 per cent, boric acid 3 per cent, "labile milk albumin" 0.8 per cent, "colloidal silicates" 1 per cent, "organic fat emulsion" 16.20 per cent) 24.5 per cent, zinc oxide 12 per cent, "organic fat emulsion" 63.5 per cent. The use of this preparation is proposed in eczema of every degree, "ulcers, especially unclean; hemorrhoids, immediate alleviation of pain" "exudate diathesis."

Fissan Lotion is stated to be composed of "Fissan Hydrogel III" ("white bolus" 3.2 per cent, boric acid 2.45 per cent, "labile milk albumin" 0.8 per cent, bismuth subnitrate 0.4 per cent, "colloidal silicates" 3.2 per cent, rice starch 8.83 per cent) 18.88 per cent, zinc oxide 23 per cent, glycerin 29.55 per cent, aluminum acetate 28.57 per cent. It is claimed that the use of this mixture is indicated in "sunburn, toxic erythemata, exanthemata, hyperhidrosis, miliaria, psoriasis in the intervals of chrysarobin treatment" and that its principal field of usefulness is in acute and subacute eczema of all types except in the hairy scalp. . . ."

Fissan Oil is stated to be composed of "Fissan Hydrogel IV" ("labile milk albumin" 1 per cent, "colloidal silicates" 2.25 per cent, talc 3.5 per cent, zinc oxide 6.45 per cent) 13.2 per cent, bismuth subnitrate 0.5 per cent, "white bolus" 1.8 per cent, boric acid 1.35 per cent, rice starch 33.15 per cent, "vegetable fat" 50 per cent. The use of this mixture is proposed in "subacute eczema, especially seborrhea," in "irritable eczema of adults," "irritable eczema of children," for "bleeding skin after shaving," in arsphenamine exanthema and in severe forms of intertrigo.

Fissan Sulphur Powder is stated to be composed of "Fissan Hydrogel V" ("labile milk albumin" 0.78 per cent, bismuth subnitrate 0.37 per cent, bolus alba 0.2 per cent, boric acid 2.45 per cent, zinc oxide 3.58 per cent, "colloidal silicates" 3.88 per cent, "organic fat emulsion" 0.5 per cent) 14.76 per cent (the total of the ingredients of Fissan Hydrogel V should be 11.76 per cent, instead of 14.76 per cent), "colloidal sulphur" 2.24 per cent, talc 81.4 per cent, rice starch 1.6 per cent. The use of this preparation is proposed by the distributer "as an adjuvant in impetigo contagiosa, acne, furunculosis after the acute stage, parasitic dermatoses, as an after treatment in intertriginous mycotic skin diseases."

Fissan Ointment R is stated to be composed of "labile milk albumin" 0.5 per cent, "colloidal silicates" 0.94 per cent, boric acid 3.01 per cent, bolus alba 3.01 per cent, strontium salicylate 1 per cent, sodium salicylate 15 per cent, salicylic acid 3.01 per cent, zinc oxide 4.01 per cent, "organic fat emulsion" 69.42 per cent, perfume 0.1 per cent. Although the external application of alkali salicylates is considered to be an inefficient method of obtaining salicylate effects, this ointment is claimed to give "excellent results in cases of rheumatic ailments."

Fissan Soap is stated to be composed of soap stock "manufactured from the best raw materials as customary in soap making" 99 per cent, casein 0.24 per cent, boric acid 0.12 per cent, "colloidal silicates" 0.05 per cent, "organic fat emulsion" 0.17 per cent, bolus alba 0.12 per cent, zinc oxide 0.3 per cent. The use of this soap is recommended for "daily washings of sensitive skins, eczema, seborrhea, psoriasis, prurigo, shampoo in cases of seborrhea" and for "damp compresses in ulcus cruris, wounds, hyperkeratosis."

In reply to a request for information in regard to the unofficial constituents stated to be contained in the Fissan preparations, the Council was informed that labile milk albumin is prepared by exposing milk albumin to incubator temperature under physiologic conditions in order to bring it into a condition favorable to catabolism. The "organic fat emulsion" was stated to be "nothing but lanolin with 20 per cent water," while the "vegetable fat" was stated to be "nothing but rapeseed oil." Walter Lehn, the importer, forwarded, along with specimens of these preparations, fourteen German reprints of articles and references to eight other German publications dealing with Fissan. The authors of these articles range from Professor Pinkus of Berlin, Professor Polland of Graz and Professor Reuss of Vienna down to Heinrich Rose, medical student: Comparative Tests with Various Preparations in Sunburn and Glacierburn ("Vergleischsversuche mit verschiedenen Fabrikaten bei Sonnen- und Gletscherbrand"). The gist of most of these articles is that the preparations contain a powder with a great absorbing power, "colloidal silicates," "Fissan Colloid," "fluor-silicic acid colloid," and "colloidal labile milk albumin," which is claimed to be of great therapeutic activity and free from irritation. These are the base of the powders. The claim is made that there are no irritating animal fats used in making up the ointments or lotions. The claim is also made for the soap that because there are no animal fats in it it is absolutely nonirritating. There is still a further exhibit constituting the distributers' advertising, entitled "Fissan," in English, giving a résumé of these different preparations, and on the last page showing how the Fissan ointment and the Fissan lotion may be used for dispensing in connection with other preparations which are classified, many of them not found in New and Nonofficial Remedies; for example, Naftalan, Bromocoll, Tumenol and Ichthyol. Of the German reprints submitted, practically all are of an uncritical type with a tendency to quote the conclusions where these same preparations have been used in other clinics. There is also a tendency throughout the articles for recommendation that the patient first be treated with Fissan ointment and then that the Fissan powder be thereafter employed. One of the authors, Karrenberg, has followed this preparation through two years of observation at the St. George Hospital in Hamburg and seems to be really enthusiastic over the line of medicament.

It is possible that there may be some therapeutic value in this new type of powder because of its absorption value, and in this new type of colloidal milk albumin; but controlled clinical evidence for such value is lacking and the advertising claims are certainly grossly exaggerated.

Without at this time passing on the adequacy of the furnished information in regard to composition and control or considering the rationality of the mixtures, the Council finds

Fissan Powder, Fissan Sweat-Absorbing Powder, Fissan Ointment, Fissan Lotion, Fissan Oil, Fissan Sulphur Powder, Fissan Ointment-R, and Fissan Soap unacceptable for New and Nonofficial Remedies because no adequate statement of composition appears on the labels or in the advertising; because the advertising brochure advertises all Fissan preparations and in some cases the label of one recommends the use of others so that the acceptance of one would constitute an indirect advertisement of all; because the names are unacceptable since they are not descriptive of composition, and because the advertising claims are extravagant and unwarranted.

When the preceding report was submitted to Walter Lehn, Importer, Oct. 24, 1931, a reply was received which indicated a desire on the part of the manufacturer and his agent to make the products acceptable. May 3, 1932, the distributer was requested to supply the Council with copies of the present labels and advertising. In response to this request there were received copies of labels for Fissan Powder, Fissan Lotion, Fissan Oil, and Fissan Sulphur Powder, which contain no declaration of composition; a pamphlet "Fissan" in which the individual Fissan preparations are not mentioned; and advertising cards for each Fissan preparation, containing a statement of composition and claims essentially similar to those given in the Council's report. The Council declared Fissan Powder, Fissan Sweat Absorbing Powder, Fissan Ointment, Fissan Lotion, Fissan Oil, Fissan Sulphur Powder, Fissan Ointment-R, and Fissan Soap unacceptable for New and Nonofficial Remedies because no adequate statement of composition has been supplied; because the names are unacceptable since they are not descriptive of composition, and because the advertising claims are extravagant and unwarranted.

EXICOL NOT ACCEPTABLE FOR N. N. R.

In 1930, Exicol (Brooklyn Scientific Products Co., Inc.) was declared unacceptable for New and Nonofficial Remedies because it was found to be a needlessly complex and therefore unscientific mixture marketed with unwarranted therapeutic claims under a nondescriptive but therapeutically suggestive name. The product was then stated to contain in each capsule "Oleic Acid 15 min., Sodium Taurocholate ¼ gr., Sodium Glycocholate ¼ gr., Desiccated Pig's Bile 1 gr., Oil Cinnamon U. S. P. ¼ min." The dosage recommended was two capsules two or three times a day. Objection was made to a number of claims in the advertising and particularly to the name of the product.

The manufacturers have modified the advertising to meet a good many of the more important criticisms. They have eliminated pig's bile from the preparation and substituted larger amounts of sodium glycocholate and sodium taurocholate. To meet the objection to the name, the manufacturers propose renaming the product "Choleol" or "Olechol," but these names are equally unacceptable with "Exicol." The present advertising is an improvement over that formerly issued, though it constitutes an indirect advertisement of the unaccepted product, "Novatone" and still makes extravagant and unwarranted claims. Most of these claims seem to be taken from an article by Levinson, which is enclosed with the other advertising. Levinson treated seventy-eight patients with various diseases of the gallbladder with Exicol and found that 59 per cent showed marked improvement, 15 per cent moderate improvement, and 26 per cent no improvement. Levinson quotes an article by McDonald, who surveyed 511 gallbladder cases. Of these, 276 were treated medically and 67.8 per cent improved. A slightly greater proportion, 73.6 per cent, showed improvement following surgery. These figures do not indicate that Exicol had any great effect on the percentage of recoveries.

The Council declared Exicol unacceptable (*a*) because it is an unoriginal combination of substances which have been in use for many years, bearing a trade name that is not descriptive of the composition; (*b*) because the advertising advances unwarranted claims; (*c*) because it is used to advertise an unaccepted preparation, and (*d*) because the statement of composition does not appear on the label or in the submitted advertising, though it is included in the trade package in the form of a slip.

This second report of the Council on Exicol was sent to the manufacturer (Sept. 24, 1931), and the firm wrote (Oct. 21, 1931) asking for an extension of time in which to meet the Council's objections to the product. Although six months has elapsed, the firm is making claims essentially similar to those to which objection was made previously and is marketing the product under the nondescriptive and unacceptable name "Exicol." This is shown by the advertising received by the Council from physicians since the date of the last report. The Council therefore confirmed its decision that Exicol is not acceptable for New and Nonofficial Remedies.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

SAVITA

A Yeast and Vegetable Extract Seasoned with Salt; Rich in Vitamin B Complex and Added Available Iron

Manufacturer.—Battle Creek Food Company, Battle Creek, Mich.

Description.—A viscous mixture of extracts of brewers' yeast and vegetables (parsley, leek, celery, onions and carrots), salt and saccharated iron oxide.

Manufacture.—The product is a mixture of the ingredients mentioned.

The yeast extract is prepared from brewers' yeast (Saccharomyces cerevisiae) obtained from the manufacture of beer. The yeast is washed in clear water, to remove bitter adhering material from hops, and extracted with hot salt brine. The extract contains the cell fluids and soluble ingredients of the yeast cells. The coagulable albumin is removed.

The vegetable extract is prepared from thoroughly washed fresh parsley, leek, celery, onions and carrots. The juice is expressed and condensed in a "vacuum" evaporator. Salt is added to the extract as a preservative.

The yeast and vegetable extracts are combined and concentrated in "vacuum" at a temperature of from 50 to 55 C. to the desired consistency of the product. The yeast extract is combined with the vegetable extract within twenty-four hours after separation of the yeast from the beer. Saccharated ferric oxide is admixed with the combined extracts to increase the iron content. The paste is heated sufficiently to flow readily through the filling machines into screw top lacquered cans or glass jars.

Savita contains no ingredient of animal origin, collagen material nor the nitrogenous compounds creatine and creatinine found in meat extract.

Analysis (submitted by manufacturer).—

	per cent
Moisture	26.0
Ash	27.8
Sodium chloride in ash	15.2
Fat (ether extract)	trace
Nitrogenous substances estimated as protein (N × 6.25)*	31.9
Crude fiber	none
Copper reducing substances as dextrose	5.6
Carbohydrates (by difference)	14.3
Iron (Fe)	0.03
Copper (Cu)	0.0028
Phosphoric acid as P_2O_5	5.1

* The nitrogen determined includes that of ammonium salts, purine and pyrimidine bases, mono and diamino acids and proteins.

Calories.—1.8 per gram; 51 per ounce.

Vitamins.—Contains from 15 to 20 units of vitamin B complex (Sherman) per gram; has from ten to fifteen times the potency of fresh moist bakers' yeast (the latter shows considerable variation) and two thirds the potency of the highest grade of dry brewers' yeast.

The B and G fractions are respectively fifteen and ten times those of fresh moist yeast.

Claims of Manufacturer.—Savita has a meatlike flavor; it is specially intended for the preparation of broths, bouillons or gravy and to add flavor to many dishes. It is a rich source of vitamins B and G and of dietary iron.

P. P. P. FLOUR (PURE PARAMOUNT PATENT) (BLEACHED)

Manufacturer.—The Concordia Milling Company, Concordia, Kan.

Description.—A patent hard wheat flour for bread baking; bleached or unbleached.

Manufacture.—Selected hard Turkey wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL (June 18, 1932, p. 2210). Chosen flour streams are blended, bleached with nitrogen oxides and a mixture of calcium phosphate and benzoyl peroxide (1 pound of the latter mixture to each seventy barrels of flour) and automatically packed in bags.

Analysis (submitted by manufacturer).—

	per cent
Moisture	13.4
Ash	0.4
Fat (ether extraction method)	1.0
Protein (N × 5.7)	9.9
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	74.7

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—A patent hard wheat flour designed for bread baking.

SMACO (207) POWDERED HALF-SKIMMED MILK

Manufacturer.—S. M. A. Corporation, Cleveland.

Description.—A powdered spray-dried half-skimmed milk hermetically sealed in tins in an atmosphere of nitrogen.

Manufacture.—See this section for SMACO (206) Powdered Whole Milk (THE JOURNAL, June 6, 1931, p. 1953); the milk fat content of the milk used is adjusted to half that normal to whole milk.

Analysis (submitted by manufacturer).—

	per cent
Moisture	2.0
Ash	6.5
Fat (ether extract)	13.5
Protein (N × 6.38)	31.0
Lactose (by difference)	45.0
(analysis of normal dilution, 5 level tablespoonfuls of powder diluted to 8 fluidounces.)	
Specific gravity 20/20 C	1.03
Total solids	10.6
Ash	0.7
Fat (ether extract)	1.5
Protein (N × 6.38)	3.3
Lactose (by difference)	4.9
*p*H	6.4

Calories.—4.3 per gram; 122 per ounce.

Micro-Organisms.—See this section for SMACO (206) Powdered Whole Milk.

Claims of Manufacturer.—This product is intended especially for infant feeding for use wherever a partially skimmed milk is indicated.

PORTOLA GARNISHED SARDINES (In Olive Oil)

Manufacturer.—K. Hovden Company, Monterey, Calif.

Description.—Cooked immature sardines (Clupea caeruleus, blue sardines) packed in olive oil with slices of pickle, carrot and pimiento; in tins.

Manufacture.—The harvesting and preparation are the same as described for French Style Portola Sardines (THE JOURNAL, July 9, 1932, p. 135) excepting that slices of pickle, carrot and pimiento are placed on the fish in the tins. The tins are placed in baskets, steam heated for eight minutes and drained for two minutes. Olive oil is added and the tins are sealed and processed under the control of the California State Board of Health as to temperature and time.

Analysis, Calories and Claims of Manufacturer.—See these sections for Portola Sardines (Pilchards) (THE JOURNAL, June 4, 1932, p. 1991).

PLAYTIME BREAD (Sliced and Unsliced)

Manufacturer.—Port Huron Bread Company, Port Huron, Mich.

Description.—A white bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from patent flour, water, yeast, a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, salt, sucrose, vegetable shortening, powdered skim milk and a partially hydrolyzed starch.

Analysis (submitted by manufacturer).—

	per cent
Moisture (entire loaf)	34.0
Ash	0.8
Fat	1.0
Protein (N × 6.25)	8.7
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	55.2

Calories.—2.6 per gram; 74 per ounce.

Claims of Manufacturer.—A bread of good quality.

AMAIZO CRYSTAL WHITE SYRUP Corn Syrup, Granulated Sugar and Vanilla

Manufacturer.—The American Maize-Products Company, New York.

Description.—A table syrup; a corn syrup base with sucrose; flavored with vanilla; packed in tins.

Manufacture.—The corn syrup is prepared as described for Amaizo Golden Syrup (THE JOURNAL, May 16, 1931). A relatively small quantity of sucrose is admixed with the corn syrup; the mixture is brought to a temperature of 82 C. and packed hot in friction top cans.

Analysis (submitted by manufacturer).—

	per cent
Moisture	23.6
Ash	0.3
Fat (ether extract)	0.0
Protein (N × 6.25)	0.1
Reducing sugars before inversion as dextrose (maltose and dextrose)	30.0
Sucrose	10.0
Dextrins (by difference)	36.0
Sulphurous acid as SO_2	0.002
Titratable acidity as HCl	0.005
*p*H	5.0-5.5

No methods are available for accurately determining the composition of syrups of this nature; therefore the foregoing analysis is roughly approximate.

Calories.—3.0 per gram; 85 per ounce.

Claims of Manufacturer.—A syrup for cooking, baking and table use and as a carbohydrate supplement in infant feeding. A wholesome energy food for children and adults.

BONWHEAT (WHEAT EMBRYO) A Vitamin B Food

Manufacturer.—Vitamin Products Company, Tucson, Ariz.

Description.—Moderately dried wheat embryo practically free from bran or other parts of the wheat berry; packed in paper bags in tins.

Manufacture.—Wheat germ from selected flour mills is sieved, cleaned of foreign material, spread out in the sun for drying, and then oven dried on trays at from 70 to 80 C. The final product is packed in bags in tins.

Analysis (submitted by manufacturer).—

	per cent
Moisture	6.
Ash	4.
Fat (ether extract)	9.
Protein (N × 6.25)	37.
Crude fiber	2.
Carbohydrates other than crude fiber (by difference)	42.

Calories.—4.0 per gram; 114 per ounce.

Vitamins.—The natural vitamin content of the wheat germ is retained in large measure; vitamin A is present; a good source of vitamin G and an excellent source of vitamins B and E.

Claims of Manufacturer.—The product is recommended as a food rich in vitamin B for raising the level of that vitamin in the diet.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JULY 16, 1932

THE BLOOD OF NATIVES AT HIGH ALTITUDES

It is a familiar observation that high altitudes, with their lowered barometric pressures, may interfere with the physiologic functions of perfectly healthy persons who encounter such environmental conditions for the first time. The untoward effects are ascribed primarily to the lack of oxygen resulting from the lowered partial pressure of the indispensable respiratory gas. Other factors, such as fatigue, may add to the discomforts that are familiar as mountain sickness and aviators' disease; but the foremost symptoms are clearly referable to some degree of oxygen want. To some persons the characteristic malaise comes at heights of only a few thousand feet above sea level; others are not affected until the barometer becomes notably low. In any event physiologic adjustments seem to occur within a short period, whereupon the affected persons are said to be acclimatized.

In 1878, Paul Bert [1] predicted that the blood of man and animals living at high altitudes would be found to have a greater oxygen capacity than that of corresponding individuals living at lower levels. He surmised that the cause of this increase in the oxygen carrying power of the blood would be found to be the decrease in the partial pressure of the oxygen in the atmosphere respired. In 1882 he gave an account of some experiments in which the blood obtained from animals living at a high altitude in Bolivia was found to contain a larger percentage of oxygen than did blood taken from animals at sea level. A little later, in 1890, Viault observed the increase in the number of red corpuscles per cubic millimeter of blood in himself and his companions during a three weeks' visit in Peru at an altitude of 14,400 feet. Numerous subsequent observations which have dealt with these phenomena have confirmed beyond question the earlier data. As an illustration of the changes in the blood in mankind living at different altitudes, the following figures may be cited: The red corpuscles vary at sea level between 4.5 and 5.4 millions per cubic millimeter; at Colorado Springs, altitude 6,000 feet, between 5.5 and 6.3 millions; and on Pike's Peak, altitude 14,100 feet, between 6 and 8.2 millions.

According to various studies on Pike's Peak, the increase in hemoglobin and red corpuscles for an individual is not the same during several trips and sojourns at that altitude. The increase occurs most rapidly when the subject is in excellent physical condition. If prior to the ascent his life has been sedentary and he is known to be physically unfit, the changes will be slow in beginning and the increase when followed day by day will be moderate or slight. If, on the other hand, the subject has taken regular physical exercise and is in excellent condition or physically fit there will be a decided rise in both hemoglobin and red corpuscles in the first twenty-four hours spent at the high altitude. It has also been shown that fatigue, induced by walking up a mountain, delays the increase in hemoglobin and red corpuscles. A recent writer [2] has asserted that it is logical to assume that the optimal physiologic processes, which make it possible for the organism to thrive favorably under a low oxygen tension, will be found in the study of the man whose adaptation represents a process of centuries. Then, he adds, perhaps we shall interpret, as it must be logically so, the failure of adaptation from the point of view of deviation from the physiology of the native of the altitude, and not from the physiology of sea level, as we do it today.

In harmony with this suggestion, observations on certain of the blood characteristics of the Indian natives of the Peruvian Andes have been presented by Hurtado.[2] His investigation was conducted in the town of Morococha, Peru, at an altitude of 14,890 feet, and with an average barometric pressure of 410 mm. of mercury. Observations on the erythrocyte count gave an average increase of about a million red cells per cubic millimeter over the sea level normal value, but a considerable percentage of these natives live with a red cell count that would be considered normal at sea level. This result indicates that an increase in erythrocytes of the circulating blood, although the common observation, is not an essential adaptation process for normal life at high altitudes. There is no relationship between the red cell count and age or body measurements. According to Hurtado, each red cell at high altitude contains less hemoglobin, as compared with the normal erythrocyte at sea level, but the corpuscular hemoglobin is not a fixed characteristic: it varies inversely with the level of the red cell count; that is, the higher the count the less hemoglobin in each cell and vice versa. Oxygen determinations in arterial and venous blood verify these

1. The statements following are taken from the Manual of Medical Research Laboratory, War Department, Air Service, Division of Military Aeronautics, Washington, 1918.

2. Hurtado, A.: Studies at High Altitude, Am. J. Physiol. **100**: 457 (May) 1932.

observations and indicate that the red cell comes to the tissues with a lower oxygen content as compared with the erythrocyte at sea level.

If these studies are substantiated by further studies in natives long adjusted to successful life more than two miles above sea level, new implications will present themselves. Hurtado suggests that the processes of adaptation to the high altitude, from the point of view of blood morphology, are to be found not primarily in red cell count and hemoglobin increases, as it has often been remarked, but rather in a fine and close correlation between cell number, volume and hemoglobin; and in the existence of a larger surface area in a given volume of blood and in the individual erythrocyte for the hemoglobin and oxygen content, factors which would favor the proper supply of this gas to the tissues. This last process, Hurtado believes, is perhaps the fundamental problem of life at high altitudes.

DIPHTHERIA GRAVIS

For a quarter of a century, investigators of infectious disease have pointed with pride to the therapeutic miracle of antitoxin for diphtheria, this major pestilence of the nineteenth century having apparently been conquered for all races and for all time. Nevertheless, diphtheria has reasserted its ancient mortality rate in parts of Europe, within the last three years. Some pessimism and theoretical perplexity followed this suddenly acquired clinical intractability. Renewed optimism, however, is inspired by the recent discovery by Anderson and his co-workers [1] of Leeds, England, that the apparent intractability may be due to the introduction or local evolution of a hitherto unknown bacterial form, for which they propose the name B. diphtheriae gravis.

The first indication that the usual serum therapy was not successful in modern diphtheria was the steady rise in case mortality in the Virchow Krankenhaus, Berlin. From a 5 per cent case mortality in 1924, the mortality rose to an average of 26.7 per cent by June, 1927. It was also noted that the refractory cases tended to be pharyngeal or nasal in character, croupous or laryngeal symptoms being rare. Deaths also were equally frequent in infants and in children over 5 years of age. Two years later, the newly refractory diphtheria was reported from France and Czechoslovakia, and a year later from Italy. Last year it appeared in Rumania and certain parts of England. The death rate in Leeds, for example, rose from about 5 per hundred thousand to an average of more than 18 by June, 1931.

In 104 consecutive cases in Leeds, Anderson and his co-workers found 63 severe cases in which pharyngeal cultures showed diphtheria bacilli of atypical morphology, atypical cultural characteristics and atypical physiologic and biochemical properties. In 35 milder cases the historic B. diphtheriae was found, for which they now propose the name B. diphtheriae mitis. In the remaining 6 cases, micro-organisms apparently intermediary between gravis and mitis were found. It is suggestive that the organism known as American Park-Williams 8 falls in this intermediary group.

The suggestion that there are at least two different types of B. diphtheriae is, of course, not new. Twelve years ago, Havens,[2] for example, reported two antigenic groups, or variants, as determined by specific agglutination tests. There was no evidence of cross-agglutination between his groups. Havens' two groups, however, showed little or no differences in morphology, in virulence or in response to commercial diphtheria antitoxin. Hence, he assumed that they were of slight epidemiologic interest. Havens, however, did suggest that the effectiveness of the therapeutic diphtheria antitoxin could probably be enhanced by including both groups in its production. The complete intractability of Anderson's diphtheria gravis to the usual diphtheria antitoxin, therefore, is the essentially new fact brought out by recent investigators. The polyvalent diphtheria antitoxin suggested by Havens therefore becomes an imperative necessity in European clinics and a suggested means of preparedness in American medicine. Of course, it is conceivable that factors other than toxin mutation are the cause of the present clinical intractability.

THE ZIFFERBLATT HAY FEVER TREATMENT

In May, a Philadelphia newspaper published a column-length article with the headlines: "Hay Fever Stayed by Discovery Here. New Inhalant Immunizing Patient to Ravages of Disease Announced." The article opened with the statement that Philadelphia, long noted as a center of medical science, had added another triumph to her achievements by "the discovery by one of her research workers of a 100 per cent successful treatment for hay and grass fever." It continued:

> "Publication of results which disclosed the complete relief of hay and grass fever sufferers in a large number of cases during the summer and early fall of 1931 were announced yesterday by Dr. Arnold H. Zifferblatt, director of the Wynne A. and Robert W. Murphy Memorial Laboratory for Hay Fever Research."

As to the details of the treatment itself, no information was given that had any scientific meaning, although the article described it as "almost ridiculously simple" and consisting essentially in the inhaling of a vapor for from six to fifteen days, which would render "complete immunity for the remainder of the hay fever season." While the article stated that "Dr. Zifferblatt is emphatic in his declaration that the vapor inhalant perfected in the laboratory is not a permanent cure for hay fever,"

1. Anderson, J. S.; Happold, F. C.; McLeod, J. W., and Thomson, J. G.: J. Path. & Bact. **34**: 667 (Sept.) 1931.

2. Havens, L. C.: J. Infect. Dis. **26**: 388 (May) 1920.

nevertheless, in another part of the same article, they quoted Dr. Zifferblatt as stating:

"As a result of the work which has been done thus far the only positive statement we can make is that patients are definitely relieved of their symptoms for the duration of the season."

Following the publicity given in Philadelphia, a special article on the subject appeared in the Sunday New York *Times* of May 29. These have been followed by reports in papers in various parts of the United States and even as far away as the London *Times*. Naturally, the interest aroused has been great. THE JOURNAL has been flooded with requests for information, and it may reasonably be believed that Dr. Zifferblatt and those associated with him in the Murphy Memorial Laboratory for Hay Fever Research have been kept busy. Dr. Arnold H. Zifferblatt, it may be interpolated, is not a physician but a dentist. Reference to the *Quarterly Cumulative Index Medicus* indicates that his total contributions to medical literature during the past ten years are as a co-author of two articles—one in 1927 in a dental journal and another in 1930 on a method of refrigerating blood for centrifugation. Dr. Zifferblatt's legal status in the matter of treating patients with hay fever is maintained by working with and presumably under registered physicians.

From letters that have been sent to THE JOURNAL, it appears that laymen who write to Dr. Zifferblatt, asking where the vapor inhalant treatment can be obtained, are told that the product has been "perfected after a long period of experimentation and is found to be extremely efficacious," but that, at the present time, the remedy is applied only at the laboratory. Dr. Zifferblatt's letter closes with the statement that he trusts they might "have the pleasure of serving" the prospective patient. It appears, too, from letters that have come in from laymen and others that the fifteen inhalations constituting the treatment cost $60.

Quite naturally, the medical profession has been as interested in the report of this proposed treatment as have laymen. Some physicians have written to Dr. Zifferblatt, asking what the vapor consists of, how it is administered, where it may be procured, and what chemical agent the treatment supplies that, according to the Zifferblatt report, digests the pollen protein. Dr. Zifferblatt's answer to all such letters as we have seen is to the effect that he and his associates are "not prepared at the present time to issue any information of a definite character until such time as the series of treatments we are now conducting will have been completed."

Summed up, then, the situation seems to be: (1) that Dr. Zifferblatt and his associates claim to have developed a treatment for hay fever that will give permanent relief for the season; (2) that no information regarding this treatment has been published in medical literature, but the widest publicity has been given it through the daily press; (3) that the composition of the drugs used and the methods of administering them are admittedly secret; (4) that at least a proportion of the public is being charged for this secret treatment, which is admittedly in the experimental stage.

Current Comment

THE FINGER NAILS IN TUBERCULOSIS

THE JOURNAL recently commented on the observations of Hahn, who found pitting of the finger nails in each of fifty patients with active tuberculosis and in only three in a group with inactive tuberculosis and in none of similar groups of ex-patients and normal controls. More recently, Whitmire of the United States Veterans' Administration Hospital at Knoxville, Iowa, reported his observations on a group of thirty-three patients with active tuberculosis and on similar groups of patients having inactive tuberculosis and on normal controls. Whitmire's patients were also mentally ill, and his results differ from those of Hahn with regard to pitting of the nails. He found pitting in only 66⅔ per cent of the active tuberculous patients, whereas Hahn found it in 100 per cent. In the group of inactive tuberculous cases, Whitmire found pitting in 30.3 per cent and Hahn in only 6 per cent. Whitmire found pitting in his nontuberculous controls in 12.1 per cent, whereas Hahn observed no pitting in his nontuberculous controls. As for longitudinal ridging of the nails, the observations of the two investigators practically agree. Transverse ridging Whitmire found in only 12.1 per cent of the nontuberculous controls as against Hahn's 26 per cent for that group. Neither observer found any cases of hippocratic curving in their nontuberculous groups. With regard to cyanosis of the nails, Whitmire's results in the active tuberculous were somewhat lower than those of Hahn but were much higher in the inactive tuberculosis group and in the nontuberculous controls. There was therefore a considerable difference in the two sets of observations. This may have been due to the fact that neither series included a sufficient number of cases from which to draw definite conclusions.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 10:45 to 10:50 a. m. over Station WBBM (770 kilocycles, or 389.4 meters). The Columbia chain program has been discontinued for the present.

The subjects for the week are as follows:

July 18. Granny Magic.
July 20. A Woman and a Hobby.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 10:45 to 11 over Station WBBM.

The subject for the week is as follows:

July 23. "That Tired Feeling."

This schedule is based on Chicago Daylight Saving Time, one hour faster than Central Standard Time.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Society News.—Clinics formed a large part of the fifth meeting of the Fort Smith Clinical Society, June 28, in Fort Smith. Papers were presented by Drs. William T. Pride, Memphis, Tenn., among others, on "Repair of Old Lacerations at Time of Delivery"; Davis W. Goldstein, "Treatment and Control of Ringworm Infection," and Jess E. Little, "Public Health Aspects of Syphilis."——The Ninth Councilor District Medical Society was addressed in Eureka Springs, June 6, by Drs. Frederick H. Krock and William R. Brooksher, Jr., Fort Smith, on "Treatment in Intracranial Injury" and "Carcinoma of the Cervix Uteri," respectively.

CALIFORNIA

State Society Awards Prizes.—At the recent annual meeting of the California Medical Association in Pasadena, it was announced that the annual prize for experimental work would be given to Dr. Harold L. Thompson, Los Angeles, for his paper on "Pyloric Resection." The clinical prize of the association will be awarded to Drs. Norman J. Kilbourne and Charles J. Murray, both of Los Angeles, for their paper entitled "Researches in New Solutions—Injection Treatment of Hydrocele."

CONNECTICUT

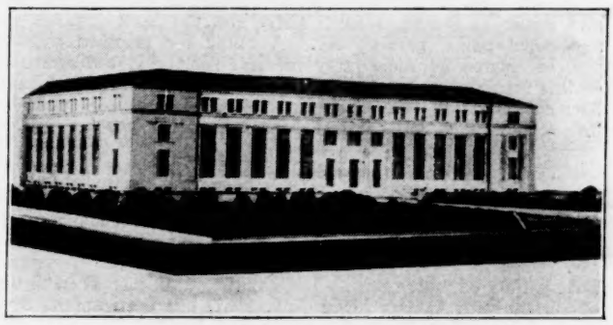
Examination of Food Handlers.—Since January 1, when the New Haven health department began a system of voluntary periodic health examinations of food handlers, and up to June 1, 221 men and women have had their examinations completed and received cards; 168 have had partial examinations. Thirty different concerns are having their employees examined. It is said that there are in New Haven 374 restaurants with 1,504 employees; 120 bakeries with 760 employees; 3 macaroni factories with 31 employees; 34 out-of-town bakery concerns operating in New Haven with 51 employees; 16 commission bakers with 16 employees; 257 soda fountains with 306 employees; 11 candy manufacturers with 90 employees; 58 delicatessen stores with 123 employees; 21 carbonated beverage and distilled water plants with 69 employees; 30 push cart venders, and 21 manufacturers of frozen ices with 60 employees.

Dr. Underhill Is Dead.—Frank Pell Underhill, Ph.D., professor of pharmacology and toxicology, Yale University School of Medicine, died, June 28, at his home in New Haven, after an illness of two months, of nephritis. Dr. Underhill, who was 55 years old, was graduated from Yale in 1900 and took his doctorate there in 1903. He served continuously on the university staff from his graduation. He was professor of pathological chemistry from 1913 to 1918 and professor of experimental medicine from 1918 to 1921, when he became head of the department of pharmacology and toxicology. During the World War Dr. Underhill served in the chemical warfare service with the rank of lieutenant-colonel as commanding officer of the New Haven Station and also in France. He represented the United States at the Inter-Allied Gas Warfare Conference in Paris in October, 1918. Dr. Underhill was an Associate Fellow of the American Medical Association and a member of many other scientific bodies. In 1930 he was selected as a member of the general committee on revision of the United States Pharmacopeial Convention. In addition to frequent contributions to technical journals, Dr. Underhill was the author of "The Physiology of Amino Acids," "The Lethal War Gases," "Toxicology or the Effects of Poison" and a manual of biochemical methods. In THE JOURNAL, July 11, page 120, appeared an article by Dr. Underhill on "Clinical Aspects of Vitamin G Deficiency," published under the auspices of the Council on Pharmacy and Chemistry and the Committee on Foods of the American Medical Association.

DISTRICT OF COLUMBIA

Dysentery Suspected in Bonus Army.—A case of epidemic dysentery was under treatment at Walter Reed General Hospital, the Chicago *Tribune* reported, July 1. As a result, Washington health officials began an investigation of the "bonus expeditionary forces," June 30, to determine whether twenty other cases reported among the veterans are of the same type.

New Building for Public Health Service.—The cornerstone of the new Public Health Service Building, now under construction in Washington, D. C., was laid, May 7, by Secretary of Treasury Ogden Mills. It is expected that the building, which will house all the administrative activities of the public health service, will be completed early in 1933. The structure will occupy an entire square on Constitution Avenue between Nineteenth and Twentieth streets, N. W., facing the grounds of the Lincoln Memorial. It will be four stories high and will have cost, when completed, $900,000, exclusive of the cost of the site. The exterior of the building is to be of white Georgia marble with limestone facing in the courts; the architecture is of a modified classical type, with window frames, spandrels and other exposed metal work of satin finish aluminum and the roof of slate colored tile, with slight variation of shade.



A small auditorium will be available on the first floor for conferences, lectures and display of health exhibits, and a comprehensive public health library will be installed in modern quarters in the center wing on the second floor. The site is of sufficient size to permit a considerable extension of the building to the north, should such an enlargement become necessary.

GEORGIA

New Health Unit.—Announcement has been made of the formation of a new health unit, consisting of the counties of Walker, Dade and Catoosa, with headquarters in La Fayette. Dr. Fred H. Simonton, who has been in charge of federal health work in the section for the past year, will be the health commissioner for the new unit, the report says. The department will include, in addition to the health commissioner, two nurses, a sanitary engineer and an office secretary, the expenses to be divided proportionately among the three counties. Dr. John H. Hammond, La Fayette, who has been in charge of health work in Walker County for several years, has resigned.

Society News.—Dr. Isham W. Irvin, Albany, among others, read a paper before the Randolph County Medical Society at Cuthbert, June 2, on "Disease of the Optic Nerve Due to Infection of Accessory Sinuses."——Dr. James S. Alsobrook, Rossville, recently discussed medical ethics before the Walker County Medical Society in La Fayette.——Dr. John Calvin Weaver, Atlanta, read a paper on "Diseases and Accidents of the Blood Vessels of the Brain" before the Fulton County Medical Society, Atlanta, June 2. Drs. Edgar G. Ballenger, Omar F. Elder and Harold P. McDonald addressed the society, June 16, on "Symptoms and Diagnosis of Affections of the Deep Urethra and Neck of the Bladder."

ILLINOIS

Appointment of Dr. Koehler.—Dr. Gottfried Koehler, for twenty years assistant commissioner of health of Chicago, has been appointed director of health and hygiene of Springfield schools. The appointment was made on the recommendation of Dr. Clarence W. Milligan, health officer of Springfield, and the Sangamon County Medical Society. The position was recently created with a view to instituting better health supervision in the schools. Dr. Koehler has been medical adviser to the registrar of the Illinois State Department of Health at Springfield.

Chicago

Dr. Harger Honored.—Dr. John R. Harger was presented with a gift recently by fifty members of the staff of the Garfield Park Community Hospital. The presentation was part of a celebration in honor of Dr. Harger on his retirement as president of the Chicago Medical Society. Dr. Harger was one of the founders of the hospital.

Society News.—At the recent meeting of the Chicago Laryngological and Otological Society, the following officers were elected: president, Dr. Charles B. Younger; vice president, Dr. Thomas W. Lewis, and secretary, Dr. Austin A. Hayden.——Dr. Raymond W. McNealy was elected president of the Chicago Surgical Society, June 3.

KANSAS

Society News.—Dr. Minford A. Hanna, Kansas City, Mo., was the guest speaker before a recent meeting of the Clay County Medical Society in Green; he discussed anatomy of the female pelvis.——The Rush-Ness Counties Medical Society was addressed, May 25, by Dr. Horace C. Embry, Great Bend, on osteomyelitis.——A joint meeting of the Wilson County Medical Society and the Southeast Kansas Medical Society, in Fredonia, was recently addressed by Drs. Clarence B. Francisco and Peter T. Bohan, Kansas City, Mo., on back troubles and abdominal pains, respectively. A clinic for crippled children was conducted by the county medical society in the afternoon of this meeting.——At a recent meeting of the Shawnee County Medical Society, Dr. Carl F. Nelson, Lawrence, spoke on "Anoxemia with Its Clinical Manifestations."

KENTUCKY

Appointments at State Hospitals.—Dr. William A. Quinn, Henderson, has been appointed superintendent of the Central State Hospital for the Insane, Lakeland, succeeding Dr. James E. Fox. At the Eastern State Hospital, Lexington, Dr. Elijah H. Maggard, Owingsville, who has been health officer of Bath County since July, 1931, has been appointed to succeed Dr. Fred G. Larue, who is in ill health.

Dr. Dabney Honored.—At a dinner given by the Louisville Medico-Chirurgical Society, June 17, Dr. Samuel G. Dabney received the felicitations of his colleagues on the completion of fifty years in the practice of medicine. Dr. Dabney has recently resigned as clinical professor of otology, rhinology and laryngology at the University of Louisville School of Medicine after forty-seven years of service at the school. He was made professor emeritus. Dr. Louis Frank, a former student under Dr. Dabney, was toastmaster at the dinner.

Society News.—Drs. Philip F. Barbour and Morris Flexner, Louisville, addressed the Christian County Medical Society, Hopkinsville, June 21, on ileocolitis and granulocytopenia, respectively.——Dr. Oscar O. Miller, Louisville, addressed the medical society of Adair, Green, Taylor and Marion counties at Columbia, June 24, on diagnosis of tuberculosis.——Dr. Carl A. Wilzback, Cincinnati, discussed the prevention of cancer before the Kenton-Campbell County Medical Society in Newport, June 17.——Drs. Irvin Abell, Louisville, and Charles F. Anderson, Nashville, among others, addressed the Warren County Medical Society, Bowling Green, June 15, on "Surgical Treatment of Retrodisplacements and Prolapse of Uterus" and "Transurethral Correction of Prostatic Obstruction," respectively.——At a meeting of the Four-County Medical Society (Hickman, Fulton, Graves and Calloway counties) in Clinton, June 30, Dr. Paul A. Turner, Louisville, among others, spoke on treatment of tuberculosis.——Dr. William Marmaduke Brown, Lexington, among others, discussed fractures at the quarterly meeting of the Licking Valley Medical Society at Cynthiana, June 16.——At a meeting of the Cumberland Valley Medical Society, Pineville, July 2, speakers included Drs. Carlisle R. Petty, Lynch, who demonstrated the use of the Delbet splint in fractures of the lower third of the leg, and Louis Frank, Louisville, who showed a motion picture on cancer.

LOUISIANA

Bills Enacted.—The following bills have become laws: H. 390, amending the osteopathic practice act by defining osteopathy as "the treatment of disease, infirmity, deformity, defect, ailment or injury of a human being, without the use of drugs or medicine except antiseptics and anodynes locally applied, by manipulations applied to the nerve centers, bones, muscles or ligament"; H. 697, prohibiting the possession, sale, disposal of, transportation or delivery in any form whatsoever of marajuana, or any of its derivatives, either dry, or in the form of cigarets or tobacco or in any way whatever.

Health at New Orleans.—Telegraphic reports to the U. S. Department of Commerce from eighty-five cities with a total population of 36 million, for the week ended June 25, indicate that the highest mortality rate (18.2) appears for New Orleans, and the rate for the group of cities as a whole, 10.1. The mortality rate for the corresponding week last year for New Orleans was 14.1, and for the group of cities, 11.2. The annual rate for eighty-five cities for the twenty-five weeks of 1932 was 12, as against a rate of 12.9 for the corresponding period of the previous year. Caution should be used in the the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have large Negro populations may tend to increase the death rate.

MICHIGAN

Golf Tournament.—The third annual golf tournament of the Wayne County Medical Society, Detroit, will be held at the Thornecliffe Country Club, September 7. There will be also an open air sea food dinner. More than 100 prizes are offered annually at this eighteen hole medal play event.

Women Physicians Present Flag to County Society.—The Blackwell Society, an organization composed of the women physicians of Detroit, presented to the Wayne County Medical Society an American flag, which hung in front of the society's new headquarters, 4421 Woodward Avenue at Canfield, for the first time on Independence Day. The flag measures 10 by 15 feet.

Personal.—Dr. Hugo Erichsen, Birmingham, received the honorary degree of doctor of letters from the College of the City of Detroit. The university also conferred the degree of doctor of science on Dr. Charles G. Jennings, Detroit.——Dr. Bror Hjalmar Larsson was elected president of the alumni association of the Detroit College of Medicine and Surgery, June 16, and Dr. Volney N. Butler, secretary.

New Scarlet Fever Regulations.—Children under 15 years of age having scarlet fever will be required to remain under a longer period of quarantine than persons over that age, in compliance with a new regulation by the Detroit health department. This change was arranged when it was observed that children in the former group are more apt to convey infection to others than persons in the latter group. It has been found practicable to have a shorter period of quarantine for patients having uncomplicated scarlet fever during the summer and autumn, as it has been observed that those who have the disease during July, August, September and October are seldom sources of infection. Patients having uncomplicated scarlet fever, whose date of report is July 1 and thereafter, will be released during the summer and autumn months at the end of twenty-one days, if under 15 years of age. Persons over 15 will be released during this period at the end of fourteen days, provided the release is recommended by the private physician and approved by the health department. A minimum period of twenty-eight days is required for persons having scarlet fever with complications. Special rules will govern the isolation of patients who are diagnosed as having scarlet fever when found to be desquamating.

MINNESOTA

Naturopath Fined.—A fine of $200 was imposed on Fred Ziegler, Elmore, June 15, for practicing healing without a basic science certificate. Ziegler, who claims to be a naturopath, has been making his living by bleeding and cupping patients, the state board of medical examiners reports. He informed the court that he had an eighth grade education in Germany but has no medical education, except that he holds a degree of "doctor of naturopathy" obtained at a school in Minneapolis. Ziegler was fined $500, June 11, 1930, at New Ulm, for practicing without a license (THE JOURNAL, July 23, 1930, p. 276).

MISSOURI

Cancer Survey.—A recent survey of the cancer situation in St. Louis and St. Louis County, carried out by the American Society for the Control of Cancer is described in the *Journal of the Missouri Medical Association.* Similar methods were employed for separate surveys in city and county. Records in the city health department indicated that, in 1930, there were 1,078 cancer deaths among white people and 109 among Negroes. By sex the deaths among white persons were fairly equal, 512 in men and 566 in women. Among the Negroes, the proportion was two women to each man. The number of cancer patients treated in the reporting hospitals of St. Louis during 1930 was 2,380. Among this number, 527 deaths occurred. Of the 382 physicians replying to a post card inquiry sent to about 1,750 physicians, 163 reported that they did not treat cancer or they had not seen any cases during 1930, nor did they have any under treatment at this time. Two hundred and nineteen physicians reported that they were treating cancer patients, Jan. 15, 1931, or had seen such patients during 1930. These physicians had seen 1,630 cancer patients during 1930, and had 748 under treatment, Jan. 15, 1931.

This would indicate, the report states, that a small percentage of cancer patients in St. Louis is being seen by physicians. The survey brought out that while the general death rate of both the city and the county is declining, the cancer death rate is rising steadily. In 1900, deaths from cancer in St. Louis represented 3.1 per cent of the total mortality, but in 1930 they represented 10.3 per cent. As far as it is possible to determine, the journal states, about 2,400 cancer patients were treated in St. Louis hospitals in 1930; of this group there were more than 500 deaths, of which 134 came to autopsy. The study indicated that many of the cancer patients treated in the city were from Arkansas, Oklahoma, Kansas and South Dakota as well as from southern Illinois and Missouri. In the survey of the county, it was shown that the cancer problem there was approximately the same as in other localities. Because of the close association of the residents of the county with the city of St. Louis, the care and treatment of cancer patients has been more closely identified with the medical and hospital facilities of the city than with those of the county. A special cancer service in the county hospital to include an adequate record system and medically trained social workers for follow-up purposes was recommended. Separate tripartite organizations, including the medical societies, health departments and cancer control committees of the city and county, were urged. These groups would cooperate to provide acceptable and adequate treatment for cancer patients in the earliest possible stage of the disease, in which there is the greatest hope of permanent relief.

NEBRASKA

Fifty Years in Practice.—Dr. Carroll D. Evans, Columbus, was the guest of honor at a dinner sponsored by the Platte County Medical Society, May 26, in honor of his completion of fifty years of medical practice. Dr. John P. Lord, Omaha, was the guest speaker. Dr. Evans was born in Pennsylvania, was graduated from the College of Physicians and Surgeons of Baltimore in 1882 and began practice in Columbus one year later. Two sons, Drs. James North Evans and Carroll D. Evans, Jr., are associated with him in practice.

NEW YORK

Hospital News.—Monthly mental hygiene clinics have recently been inaugurated at Oneida under the direction of the Marcy State Hospital.——Dr. Percy B. Battey, acting medical superintendent of the Institution for Defective Delinquents at Napanoch, has been appointed superintendent of Westfield State Farm, Bedford Hills.

Buffalo's First Mayor.—The Medical Society of the County of Erie and the Buffalo Academy of Medicine devoted the May issue of their joint bulletin to historical accounts of the organizations and of the Buffalo Department of Health in recognition of the one hundredth anniversary of the incorporation of the city of Buffalo, which was celebrated, July 1-10. The first mayor of the city was Dr. Ebenezer Johnson, who was a charter member of the Medical Society of the County of Erie. Dr. Johnson began practice in Buffalo in 1809 and lived there until 1837, when he moved to Tennessee, where he died in 1849. One of the mayor's first acts was to recommend the appointment of a board of health, which was called on to combat an epidemic of cholera within a month after its establishment. The county society was founded in 1821 and the Buffalo Academy of Medicine in 1892.

New York City

Course in Physical Therapy.—Columbia University College of Physicians and Surgeons will offer a three weeks' course in the theory and practice of physical therapy to qualified graduates in medicine, beginning Monday, September 12, and ending Saturday, October 1. This graduate course, which will follow the session of the American Congress of Physical Therapy, will be conducted under the direction of Dr. Norman E. Titus and his associates. Lectures and demonstrations of apparatus will be held the first week, clinical demonstrations, the second, and supervised clinical practice by members of the course, the third. The class will be limited to twelve; the fee is $100.

The Fountain Squad.—More than 100 dealers in refreshments and foods at shore and river resorts and parks were found violating health department regulations during the first ten days of a drive opened, June 1, by the "Fountain Squad" of the bureau of food and drugs of the city health department. Food that was displayed uncovered was condemned and confiscated, and all food-dispensing emporiums were inspected. The sanitary code requires, among other things, that ice cream freezers and frozen custard machines must be frequently dismantled for inspection, that milk pumps must be sterilized every twenty-four hours, that glasses for soft drinks must be sterilized before each use, and especially that all persons who handle food must have an official card certifying that they are free from disease.

OHIO

Alumni Reunion.—Four physicians of the class of 1882 were guests of honor at the 1932 alumni reunion of the University of Cincinnati College of Medicine, June 10: Drs. Edwin W. Mitchell, Benjamin F. Lyle, Cincinnati, Horace D. Price, Parkersburg, W. Va., and John C. Sexton, Rushville, Ind. All are still in active practice. Dr. Dudley W. Palmer presided at the meeting, Dr. Mitchell spoke for the golden anniversary class, and Rabbi James C. Heller made an address on "The Challenge to the Medical Profession." Dr. Alfred Friedlander was elected president of the alumni organization.

Illegal Practitioners Prosecuted.—Within recent weeks the state medical board has obtained convictions in the prosecution of the following illegal practitioners, among others:

D. A. Row, Dayton, who posed as a physician and treated a woman for an infection of the eye, was fined $400 and is confined in the county jail at Dayton.
Herand Robinson, Columbus, unlicensed chiropractor, was given a deferred sentence of one year and placed on probation.
Pauline Bontunipo, Cleveland, was fined $25 and costs and assigned to the probation department, after being found guilty of illegal practice.
O. D. Johnson, Canton, was fined $35 and costs for practicing without a certificate.

At the time of this report, seven chiropractors were under arrest and awaiting trial. The board reported that during 1931 it had made 400 investigations, with 52 arrests and 41 convictions.

Personal.—Dr. John Pascal Sawyer, professor of therapeutics and clinical medicine at Western Reserve University School of Medicine, has been made professor emeritus. Dr. Sawyer has been associated with the university since his graduation there in 1886, except for two years spent in European study.——Dr. Robert T. Leever, South Charleston, has been appointed health commissioner of Pike County, succeeding the late Dr. Oliver R. Eylar.——Dr. Martin H. Fischer, Cincinnati, received the honorary degree of doctor of science at the annual commencement of Wittenberg College, Springfield, at which he delivered the principal address.——Citizens of Uniontown held a celebration, June 2, in honor of the seventy-ninth birthday of Dr. Milton M. Bauer, who began practice in the town immediately after his graduation from Long Island College of Medicine, Brooklyn, in 1880.

PENNSYLVANIA

Bill Introduced.—H. 67-XX proposes to repeal an act approved May 6, 1929, P. L. 1561, authorizing the department of welfare to license and regulate all maternity hospitals except such maternity hospitals as are located in cities of the first and second class.

Society News.—Dr. Frank P. McCarthy, Erie, was elected president of the Northwestern Pennsylvania Medical Society at its annual meeting in Clarion, June 16. Dr. Charles H. Mayo, Rochester, Minn., was among the speakers.——Dr. Samuel Calvin Smith, Philadelphia, addressed a joint meeting of the Columbia, Lycoming and Montour county medical societies at Bloomsburg, June 3, on "Clinical Significance of the Irregular Pulse."——The Pennsylvania Student Health Association was recently organized at a meeting at Pennsylvania State College, State College. Dr. Joseph P. Ritenour, director of health service at the college, was elected president.

Philadelphia

Personal.—Mr. Charles Perry Fisher has retired after fifty years of service as librarian of the College of Physicians of Philadelphia.——Dr. Louis H. Clerf was elected president of the Philadelphia Laryngological Society at the recent annual meeting.

Dr. Keen Willed Brain to the Profession.—Dr. William Williams Keen, who died in his ninety-sixth year, June 7, bequeathed his brain to the medical profession for examination and study. In his will, he directed that Drs. Francis X. Dercum (who died April 23, 1931), William J. Taylor, Jacob Parsons Schaeffer and Willis F. Manges make a postmortem examination. The examination, which was made by Dr. Schaeffer, revealed that the immediate cause of Dr. Keen's death was intestinal obstruction resulting from adhesions that followed an operation performed several years ago. Dr. Keen bequeathed substantial amounts to the aid association of the

Philadelphia County Medical Society, the College of Physicians of Philadelphia and Jefferson Medical College. A fund was also set aside in the will to establish at Brown University, Providence, R. I., of which Dr. Keen was a graduate, the Corinna Borden Keen Research Fellowship Fund for the Advancement of Pure Science.

SOUTH DAKOTA

State Medical Election.—Dr. Edward W. Jones, Mitchell, was named president-elect of the South Dakota State Medical Association and Dr. John R. Westaby, Madison, became president at the annual meeting at Watertown in June. Dr. William G. Magee, Watertown, was elected vice president and Dr. John F. D. Cook, Langford, reelected secretary. The next meeting will be held in Huron.

WEST VIRGINIA

State Medical Election.—Dr. Delivan A. MacGregor, Wheeling, was elected president of the West Virginia State Medical Association, at the annual meeting in Parkersburg, June 21. Vice presidents elected were Drs. James A. McClung, Richwood, and Thomas L. Harris, Parkersburg. The annual meeting for 1933 will be held in Charleston.

GENERAL

Society News.—The annual roll call of the American Red Cross will be held between Armistice Day, November 11, and Thanksgiving, November 24.——The annual meeting of the Polish Medical and Dental Association of America will be held in Wilkes-Barre, Pa., August 18-20.——Dr. John L. Pomeroy, Los Angeles, was chosen president-elect of the western branch of the American Public Health Association at the annual meeting in Denver, June 11. Dr. Amos L. Beaghler, Denver, became president.

Study of Therapeutic Malaria.—Methods of procuring and keeping pure strains of benign tertian malaria for use as a therapeutic agent in the treatment of dementia paralytica are the subject of an investigation by the U. S. Public Health Service cooperating with the South Carolina State Hospital, Columbia, S. C. With the increasing use of this method of treatment, it has been found that psychiatric hospitals frequently lose the pure strain of malaria, and the object of the present investigation is to devise a method of shipping infected mosquitoes in order to make the treatment available in any place. Bruce Mayne of the public health service is in charge of the work.

Williams and Wilkins Purchase William Wood and Co.—The Williams and Wilkins Company of Baltimore announces the purchase of the inventory assets of William Wood and Company, medical publishers, New York, including good will and use of the Wood name and imprint. The Wood business has been in the hands of an executor since the death in October, 1931, of Gilbert C. Wood, last surviving member of the family with an interest in the firm, which was established in 1804 by Samuel Wood. The firm name will be perpetuated and for the present the business will be conducted from 156 Fifth Avenue, New York, although it will probably be moved to Baltimore eventually. The list of titles of the combined concerns approximates 600.

Warning Against Swindler.—A New Mexico physician sends a warning to physicians concerning a swindler who requests a roentgenogram of a crippled hand. He presents papers bearing the name of the Maryland Casualty Company of Baltimore. After the roentgenogram is made, he gives the physician a check drawn by the Baltimore firm on its own check paper, invariably for $36.50. The victim gives him the difference between that amount and his charge for the service and learns later from the Maryland Casualty Company that he has been swindled. The man's deformity is unmistakable, according to the report. The middle three fingers of his right hand are missing, leaving him with only the thumb and little finger. The man, who uses various names, is said to appear intelligent, and the letters and blank forms he uses are apparently perfect forgeries.

Recommendations Concerning Milk.—At the recent meeting of the State and Provincial Health Authorities of North America in Washington, D. C., the committee on milk made recommendations concerning milk production. The committee disapproved the use of the term "natural milk" to denote "raw milk," arguing that pasteurized milk is as much natural milk as the raw product. It approved the process of short time-high temperature pasteurization and upheld the requirement of the standard milk ordinance of the U. S. Public Health Service that any firm which handles more than one grade of milk must use separate equipment for each grade. The committee also considered the practice of recombining skimmed milk and cream and expressed the opinion that it should be forbidden unless both the milk and cream come from inspected sources and unless the product is labeled to show its true character.

Primer on Rheumatism.—The American Committee for the Control of Rheumatism prepared in connection with its exhibit at the New Orleans session of the American Medical Association a "rheumatism primer" summarizing the present understanding of the diagnosis and treatment of the various forms of chronic arthritis. The committee announces that the primer, together with a chart presenting an outline of the factors influencing the course of the disease and a concise statement of the present concept of the disease, may be obtained from the chairman, Dr. Ralph Pemberton, Philadelphia, or the secretary, Dr. Philip S. Hench, Rochester, Minn. At the semi-annual meeting of the committee, May 11, it was decided to hold a conference every year, preferably in connection with the meetings of the American Medical Association. Such a conference was held, May 9, in New Orleans (THE JOURNAL, May 7, p. 1668).

American Association for the Advancement of Science—Section N.—The medical program for the summer meeting of the American Association for the Advancement of Science at Syracuse, N. Y., June 20-24, was arranged jointly by Section N (the medical sciences) of the association, the Onondaga County Medical Society and the Syracuse Academy of Medicine. A demonstration session was held, June 22, in Lyman Hall of Natural History and the following program of lectures was presented, June 23:

Dr. Robert Elman, St. Louis, "Treatment of Acute Intestinal Obstruction: Recent Experimental and Clinical Studies."

Dr. Abraham Clement Silverman, Syracuse, "Epidemiology of Poliomyelitis as Based on Syracuse Experience."

Drs. James R. Wilson, Tyree C. Wyatt, Orren D. Chapman and J. H. Bennett, Syracuse, "Studies in Allergy: The Effect of Fasting on Anaphylactic Shock in Guinea-Pigs."

Dr. Edward N. Packard, Saranac Lake, N. Y., "Value of Surgery in the Treatment of Pulmonary Tuberculosis."

FOREIGN

Centenary Dinner.—The British Medical Association will hold its centenary dinner at Albert Hall, London, July 28, during the annual meeting. Lord Dawson of Penn, president-elect of the association, will preside and the Prince of Wales will be the principal guest.

International Prize Offered.—The Medical Society of Evian-les-Bains announces that a second series of "Medical Days" will be held in Evian in September, 1933. Professor Lemierre will preside and the subject for study will be "renal insufficiency." For this occasion the "Incorporated Society of Mineral Waters of Evian-les-Bains" will offer an international prize of 10,000 francs, in honor of the memory of the hydrologist Chiais, for the best original work on "the pathognomonic value of tests for induced diuresis." The manuscripts, written in French and unsigned, must be sent to the headquarters of the Société des Eaux Minérales d'Evian-les-Bains, 21, rue de Londres, Paris, before May 15, 1933. Information concerning the conditions of the award may be obtained from the society at that address.

Proposed Institute for Plague Research.—In order to carry out a program of research on plague, the establishment of a Plague Research Institute in Yulin, China, was recommended in a report in the *Chinese Medical Journal* of the investigation of an outbreak of plague late in 1931. Yulin was considered the best location for this institute, because it is practically in the center of the plague focus. It was recommended that the institute have its own power station, stables, water supply, bath, dwelling houses, laboratory and library. The recent outbreak of bubonic and pneumonic plague in Shansi and Shensi was unusually extensive and advanced into districts heretofore unaffected. It resulted in a special investigation by a mission sent by Dr. J. Heng Liu, director of the national health administration. In Lin Hsien County alone, it was said, eighty-five villages were infected, with more than 1,000 deaths. One of the most severe outbreaks occurred in the villages around Muton Ui. The first report of Dr. Percy T. Watson, director of the hospital at Fenchow, Shansi, showed that 100 villages were infected (THE JOURNAL, Dec. 19, 1931, p. 1901).

Deaths in Other Countries

Bernhard Laurits Frederick Bang, professor of pathology and therapy in the Royal Veterinary and Agricultural College, Copenhagen, Denmark, died June 22, aged 83. He was known especially for the isolation of the bacillus of infectious abortion, sometimes called "Bang's bacillus."

Government Services

Change of Station in the Navy

Lieut. Robert K. Y. Dusinberre from navy medical school, Washington, D. C., to the first brigade, U. S. Marines, Haiti; Lieut. Harold O. Cozby from naval hospital, Washington, D. C., to Asiatic Station; Lieut. Clifford A. Swanson from the naval dispensary, navy department, to Asiatic Station; Lieut. Edward M. Harris from the first brigade, U. S. Marines, Haiti, to the naval hospital, Boston; Lieut. Clark T. Alexander from the U. S. S. *Asheville* to the marine detachment, Peiping, China; Lieut. Walter F. J. Karbach from the marine detachment, Peiping, China, to the U. S. S. *Asheville;* Lieut. Ralph E. Fielding from the fourth regiment, U. S. Marines, China, to the receiving ship at New York; Lieut. David H. Davis, from the marine corps base, San Diego, Calif., to the Asiatic Station; Lieut. Otto L. Burton from the naval radio station, San Juan, P. R., to the naval hospital, Parris Island, S. C.; Lieut. Comdr. Samuel H. White from the naval medical school, Washington, D. C., to the second brigade, U. S. Marines, Nicaragua; Lieut. Comdr. Ely L. Whitehead, from navy hospital, San Diego, Calif., to Asiatic Station; Lieut. Comdr. Charles H. Savage to naval hospital, Portsmouth, N. H.; Comdr. Claude W. Carr from naval station, Guantanamo Bay, Cuba, to naval hospital, naval training station, Great Lakes, Ill.; Lieut. Robert C. Boyden from naval training station, Norfolk, Va., to Asiatic Station; Lieut. Benjamin E. Twitchell from naval hospital, Mare Island, Calif., to U. S. S. *New York;* Lieut. Craig B. Johnson from submarine base, New London, Conn., to the submarine base, Pearl Harbor, T. H.; Lieut. Bruce V. Leamer, from naval training station, Great Lakes, Ill., to Asiatic Station; Lieut. Comdr. Ruskin M. Lhamon, from naval hospital, Mare Island, Calif., to naval station, Guantanamo Bay, Cuba; Lieut. Comdr. Paul Richmond, Jr., from naval medical school, Washington, D. C., to Asiatic Station; Lieut. Frederick G. Merrill, Jr., from naval station, Olongapo, to the fourth regiment, U. S. Marines, Shanghai; Lieut. Glenn S. Campbell from naval hospital, Washington, D. C., to naval station, Guam; Lieut. Edwin B. Coyle, from San Diego, Calif., to naval station, Guam; Lieut. Clifford D. Hamrick, from New London, Conn., to naval station, Guam; Lieut. Thomas Jackson, Jr., from League Island, Philadelphia, to Asiatic Station; Lieut. Rafael A. Vilar, from Parris Island, S. C., to naval radio station, San Juan, P. R.; Lieut. Comdr. Benton V. D. Scott, from submarine base, Pearl Harbor, T. H., to naval hospital, San Diego, Calif.; Lieut. Comdr. Jonathan E. Henry, from Naval Academy, Annapolis, Md., to the American Scientific Mission, Port au Prince, Haiti; Lieut. Comdr. Sterling S. Cook, from the mission, Haiti, to the naval medical school, Washington, D. C.

Health of Troops in Shanghai

Unsatisfactory quarters, contact with infectious diseases among civilians and inclement weather contributed to the spread of an epidemic of influenza and other respiratory diseases among the troops which were sent to Shanghai from the Philippines in February. The epidemic reached its height about March 10. As a result, the annual admission rate for that period was 815 per thousand. The report states that it was difficult to prevent the spread of infections, as the troops had to be billeted in cold, drafty buildings and the city was filled with war refugees, many of whom were camped near the billets. An acute outbreak of measles occurred during the five weeks ended April 30. During the first eight weeks there were five cases of smallpox. The sick were cared for in the Shanghai General Hospital and the Municipal Isolation Hospital until a military hospital was opened, February 28. Three deaths occurred in April, two from pneumonia following measles and one from streptococcic meningitis.

Dinner to Colonel Webb

Col. Louis H. Webb, recently transferred from U. S. Veterans' Hospital No. 99 at Excelsior Springs, Mo., to the veterans' hospital at Muskogee, Okla., was the guest of honor at a dinner given by the Chamber of Commerce and the Federal Employees' Association of Excelsior Springs, June 14. A writing set was presented to Colonel Webb by the hospital personnel and a resolution commending his administration was adopted by the chamber of commerce.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 18, 1932.

British Spas

The movement to encourage the use of British spas, which has been brought about by the financial depression, has been reported in previous letters. The medical advisory committee of the British Health Resorts Association has issued a statement which declares that it is not sufficiently recognized that in Britain there are waters and bath establishments quite as valuable as any to be found abroad for most of the ailments commonly treated at such places, and that some springs are quite remarkable. The British spas are distinguished from those of the continent by their invigorating and tonic quality imparted by the Northern island climate. In the North, Strathpeffer, Buxton and Harrogate offer a tonic summer treatment. Woodhall spa is more sheltered. At the Welsh spas and at Leamington, Cheltenham and Droitwich in the Midlands, tonic and sedative influences are combined. Bath is the warmest and most sedative of British spas and eminently suited for treatment in winter. The hot springs, rising at 120 F., were used by the Celts and the Romans. At Bridge of Allan, in the lowlands of Scotland, are calcium waters. The warm blue waters of Buxton have been used since the sixteenth century. The salines of Cheltenham and Leamington are suitable for spa treatment at all seasons for delicate and elderly persons and those who have returned from the tropics. The brines of Droitwich are ten times as strong as sea water. Harrogate has a remarkable outcrop of sulphur, saline and iron springs.

Church Conference on Birth Control

A committee of the lower house of convocation of Canterbury, discussing the subject of birth control, notes that the firm tone of previous conferences has been qualified since the conference of 1908 described "all artificial means of restriction as demoralizing to character and hostile to national welfare." The report regrets, however, the statement of a majority of the bishops that "other methods than abstinence" may be used in some circumstances. The present conference deprecates this admission and says: "If directions of this kind are to be given by the church, we are convinced that the ideal of the Christian life, as one under discipline, must be upheld at all costs." However, a minority of the conference agrees with the previous pronouncement of a majority of the bishops that, "safeguarded by the many limitations and qualifications laid down, the use of contraceptives may be right in certain cases."

Life Insurance and Venereal Disease

At the Medical Society for the Study of Venereal Diseases, Mr. H. E. Melville opened a discussion on the attitude of life insurance societies to venereal diseases. He gave the general principles according to which his office (the National Provident Insurance Society) acted. If an applicant had had repeated attacks of gonorrhea, even if each attack had been cured, he was charged extra. For one attack which had been cured, ordinary rates would apply. But if he had stricture which had not been cured, he would either be regarded as not insurable or be definitely loaded. A syphilitic person would be accepted only under the following conditions: (1) He should have been thoroughly treated; (2) several years should have elapsed from the date of infection and treatment, and no symptoms should have developed in the meantime; (3) his physical condition, family history and habits should be satisfactory. Even with these conditions, ordinary terms would not be granted. A man who acquired syphilis at or after 40 was considered a worse risk than one who acquired it at a younger age.

In the discussion that followed, doubt was expressed whether the modern treatment of syphilis was altogether an advantage, as it might impair the vitality of essential organs. The optimistic view which Sir Jonathan Hutchinson took of syphilis treated by long continued small doses of mercury was quoted and also his statement that he would like to run an insurance company entirely for the syphilitic, as it would make a good profit, seeing that the syphilitic would henceforth live a careful life.

Protection Against Electrical Shocks

The ministry of health has issued a memorandum for distribution to hospitals, nursing and convalescent homes and clinics drawing attention to the dangers from the use of electrical apparatus, which are increased by the tendency for hospitals to change over from their own direct current of low voltage to the standard alternating current of 230 volts. A fatality has recently been reported from electrical treatment of a patient in bed. It is pointed out that an iron bedstead should never be in such a position that by contact with radiator pipes or even with an "earthed" wireless receiver it may act as a means of grounding the patient. Precautions are necessary in view of the increased use of radiant heat baths, resuscitation cradles, thermal pads for eye and ear work, and similar appliances receiving current from the main. Where apparatus is of the nonearth-free type, patients undergoing treatment in the same room should not be within reach of one another. It is suggested that under the conditions existing in many wards—wooden floors and small chance of contact with ground metal—electrical safety is best secured by insulating apparatus instead of grounding it. But where there are conducting floors the metal work of the apparatus should be grounded and care taken to insure the efficiency of the connections. The source of supply for heat treatment by electrothermal compresses should always be of low voltage. If patients wearing wireless head phones are undergoing electrical treatment or are in a position to handle electrical apparatus, attention should be paid to the insulation of the output circuit to which the phones are connected, which can be done by a double-wound isolating transformer. Radiant heat baths are a source of danger, against which three precautions should be taken: (1) An internal mesh screen should be used to cover the lamps and holders; (2) the holders should be of insulating heat-resisting material; (3) metal work should be grounded. In projectors for light treatment, live conductors are exposed within the reflectors, and this is true also for arc lamps. Though it is not likely that the live parts will be touched while the apparatus is in use, mesh guards would minimize the risks to the operator. The metal work projectors should be grounded. It is advisable to insure against interruption of the current while the patient is being treated. While current of considerable densities may flow without discomfort provided efficient contacts are made, a sudden interruption, such as might be caused by a fuse blowing out, a bad contact in a plug fitting, or a breakage of a flexible connection, would produce shock which might be severe. Therefore the use of sets which are not isolated electrically from the main supply is deprecated.

Diathermy apparatus is of two kinds: In one the patient is subjected to a low voltage high frequency current; in the other, to a minute current at high pressure and frequency. In both cases the necessary transformation isolates the patient from the mains, but in both cases an intermediate low frequency current operates at pressure ranging from 2,000 to 6,000 volts, which is sufficient to cause severe shock. Preference is given to designs in which the patient's circuit is isolated from the intermediate circuit, the spark gap is mounted inside the cabinet, and the door of the cabinet is so interlocked with the source of the main supply that its opening disconnects the latter. It is recommended that all apparatus be inspected regularly by experts.

PARIS

(From Our Regular Correspondent)

June 8, 1932.

Combined Antidiphtheria and Antityphoid Vaccination

Mr. Dopter, a bacteriologist and a former director of the army medical department, presented recently to the Academy of Medicine an important communication on the reinforcement of immunity, in antidiphtheria vaccination, by the association with it of antityphoid vaccination. His researches were begun in 1930, and the army, in which vaccinations are compulsory, furnished an excellent field of observation. He first employed antidiphtheria vaccination by means of the Ramon anatoxin, in three injections, given at intervals of fifteen days, which enabled him to secure 95 per cent of immunization, as confirmed by the Schick test and the determination of the antitoxin content of the blood serum. He improved these results by employing a new and richer anatoxin, in accordance with the experiments carried out by Ramon, Debré and Mozer, at the Hôpital maritime des enfants, at Berck. With two injections, the proportion of successful immunizations was raised to 98.6 per cent. Two garrison outbreaks permitted him to raise the proportion of immunizations still further by combining, during one outbreak, antityphoid vaccination with the use of the new anatoxin. Mr. Dopter presented to the academy his most recent statistics. He applied the new method to twenty-nine regiments affected by the outbreak of diphtheria. Combined vaccination was applied to the young recruits, on their arrival, but only to those presenting a positive Schick reaction. The author observed that the persons vaccinated did not contract diphtheria, and that, furthermore, the outbreak of diphtheria soon died out. Of a total of 5,923 persons vaccinated, only twelve contracted diphtheria, from which number seven should be deducted, as they had been attacked from two to fifteen days after the third injection, before immunity had been established, which gives a percentage of failures amounting to only 0.084, whereas, in the other regiments not vaccinated, the percentage of patients reached 1.07. These comparative percentages are instructive. Furthermore, in order to obtain exact information as to the increase of immunity due to the addition of antityphoid vaccine, the percentage of antitoxin contained in the blood serum of fifty-one subjects completely vaccinated was determined, and it was found that in all, the antitoxin content was greater than one thirtieth of an antitoxin unit, which corresponds to a negative Schick reaction. In 35 per cent, the antitoxin content ranged between 0.1 and 1 unit. In many, the antitoxin content exceeded 1 unit, attaining sometimes even 20, 30 and 40 units. By an equal number of antitoxin units, the combined vaccination, with two injections of new anatoxin, proved superior in its effects to the vaccination with the old anatoxin, and even with the new vaccination when employed alone. The army milieu, in which, by reason of the needs of instruction, there is a great advantage in being able to reduce the number of injections, cannot help but benefit from the effectiveness of the anatoxin with the increased antitoxin content. Whether one uses this anatoxin alone after the antityphoid vaccine has been applied, or whether one uses it in combination with the antityphoid vaccine, antidiphtheria immunity can be assured by two injections with a degree of success at least equal to that secured by the ordinary method. Mr. Dopter believes, therefore, in the advantages of this method, which constitutes a potent means of combating endemic diphtheria and the spread of epidemics. Its application is facilitated by the law of Dec. 21, 1931, which has made it compulsory in the army.

The Seventeenth Congress of Legal Medicine

The seventeenth Congress of Legal Medicine was held in Paris under the chairmanship of Professor Raviart of Lille. The session was opened by Mr. Chiappe, prefect of police in Paris, who, in his address, demanded that psychiatry define the

social status of half-wits, who, sometimes dangerous, are allowed their full liberty and are the authors of more than half the crimes committed. Professor Raviart, in turn, discussed the question of crimes committed by the insane, and called attention to the difficulties that prevent, under the present state of legislation, the early discovery of the insane and the employment of measures of prophylaxis; in particular, by reason of perverted public opinion excited by the threat and the fear of arbitrary and abusive interment, which fact often discourages any initiative on the part of physicians or alienists. As for the police, it waits always for the crime to be committed before it takes any action. Among other communications, Prof. Etienne Martin of Lyons made a remarkable medicolegal study of the lesions occurring in death from drowning. Naville and de Morsier took up the problem of the possible rôle of cranial traumatisms in the development of Parkinson's syndrome. This appeared, in 25 per cent of the cases, as a complication of epidemic encephalitis. They hold that grave traumatisms may cause this encephalitis to appear, but also that it may be awakened by latent micro-organisms, as sometimes results from smallpox vaccinations. They considered also the rôle of purely psychic traumatisms, especially in aged persons. Mr. Génil-Perrin discussed in his paper the relations of psychoanalysis to legal medicine. If properly carried out, psychoanalysis may perform a useful reeducative task in removing a person from the domination of the subconscious to a state of lucid consciousness. It may bring about recoveries and make it possible to restore full freedom to patients who have regained their mental poise. Mr. Mauclaire presented a paper on scapulohumeral periarthritis due to the presence of intra-articular calcifications. Professor Balthazard spoke on remote bone changes in persons with amputated limbs, resulting, more particularly, from a static disequilibrium of the body. Mr. de Laët of Brussels called attention to nuclear reactions due to toxins.

The First French Woman to Occupy a Chair of Medicine

Mlle. M. Condat, who, in 1923, as the result of a competitive examination, became an associate professor of medicine, the first French woman to occupy such a post, has now been appointed to a chair of therapeutics at the Faculté de médecine de Toulouse. While serving as intern in the hôpitaux de Paris, Mlle. Condat was chiefly under the tutelage of Professor Comby. In 1916, she defended her doctor's thesis on leukocytolysis and fragility of the leukocytes. Mlle. Condat is a member of the Societé de pédiatrie de Paris and has published numerous articles on diphtheria, cerebrospinal meningitis, and infectious diseases in general. At Toulouse, since 1923, her work of instruction has dealt with experimental and general pathology, and medical pathology, while, at the same time, she has had charge of the Laboratoire de chirurgie at the Hôtel-Dieu, Paris.

BERLIN

(From Our Regular Correspondent)

June 6, 1932.

The Founding of the University of Würzburg

During the middle of May, special ceremonies were begun at Würzburg in commemoration of the founding of the university in 1582 by the bishop-prince Julius Echter v. Mespelbrunn. One cannot think of the university without recalling the Julius Hospital, which the bishop-prince established a few years before the university was founded, although the original hospital structure has not been preserved. This hospital, with its beautiful old garden, its old pharmacy typifying an early rococo style of architecture, and its wine cellar of international fame, seems to breathe the spirit of the chief city of Lower Franconia: the fantastic baroque mingled with the more somber aspects of medicine.

The university owes its fame chiefly to the faculty of medicine, along with the department of the natural sciences. From this city, in which Albertus Magnus and Paracelsus spent some time, sprang some of the greatest names in the medicine and surgery of this period: the archeologist Athanasius Kircher, who searched for the causative agent of the plague; the families that produced so many eminent anatomists and surgeons: v. Siebold, Döllinger, Virchow, which latter established in the Julius Hospital the first pathologic institute in Germany; E. v. Bergmann, Franz Hofmeister, Leube, and the great professor of otology Anton v. Tröltsch. Other famous names are Haeckel, the zoologist v. Leydig, the botanist Julius Sachs, the chemist Emil Fischer and Roentgen. Many others have achieved fame in the field of the natural sciences.

At the opening of this century, the University of Würzburg had about 1,300 students; the attendance has now increased to more than 3,000. The university has now more than a hundred professors, and a library of 600,000 volumes, including 2,000 incunabula. It has an important historical museum of art and a great many institutes devoted to the natural sciences and to medicine. The Luitpoldkrankenhaus, with its six buildings, one of the most modern hospitals in Germany, was completed in 1924. The ceremonies were held under the presidency of a medical man, the pharmacologist Professor Flury, who emphasized that the celebration was not in honor of Würzburg alone but of the whole German people, and, indeed, one might say, of the whole world of science.

Death of Max Rubner

Prof. Dr. Max Rubner died, April 27, aged 77. He was one of the most eminent physicians of Germany; one of those who established the trend of medical thought for a whole generation of physicians. Rubner was a hygienist and a physiologist and held successively a chair in both subjects. A mutual illumination of hygienic and physiologic problems gives his great works a peculiar character. Especially original were his achievements in the field of nutrition, in which he continued the work of his teacher Voit (of Munich).

In a noteworthy work on the isodynamics of food products, Rubner was the first to show that the quality of food substances is not determined by the amount of oxygen required for their combustion but by their calory content. He showed further in his fundamental tables that the calory production of proteins, fats and carbohydrates can be given in figures with considerable accuracy. On the basis of calories (that is, on Rubner's idea), food computations have since been reckoned in all civilized countries. In collaboration with Thomas, Rubner established that for man and animals proteins do not all have an equal value but that the biologic value of protein bodies varies considerably. This discovery has become one of the most important bases of the present-day theory of nutrition. During the war he served as nutrition expert of the German government and in that capacity gave, in 1919, at the conference at Spa, his opinion on the effects of the food blockade. In recent years Rubner has done little research work but in a number of academic treatises has shown his depth of insight into practical nutritional problems. Furthermore, in a number of special articles he has criticized the preposterous claims and conceptions set up by would-be specialists in the field of nutrition. These writings of the master have served an important purpose, and merit our gratitude.

Rubner was born in Munich and studied under Voit and also under the physiologist Karl Ludwig. After the death of Robert Koch, he was given the chair in hygiene and later the chair of physiology. He created the large new Physiologic Institute, which has become a research center of international scope. From 1910 to 1911, he was rector of the university. He served as perpetual secretary of the Prussian Academy of Sciences. He founded and was an honorary member of the Institut für Arbeitsphysiologie of the Emperor William Society for the Advancement of Science. Rubner possessed extraor-

dinary energy. Of his numerous publications, a book on "Kraft und Stoff im Haushalt der Natur" has become known far beyond professional circles.

Professor Volhard's Sixtieth Birthday

On May 2, Professor Volhard, clinician of Frankfort, celebrated his sixtieth birthday. Volhard became prominent in the field of kidney and heart disease. He proposed also the specific gravity test for the functioning of the kidneys. He and Fahr published an important work on the clinical aspects of Bright's disease, and likewise a comprehensive work on the bilateral hematogenic disorders of the kidney. In the field of diseases of metabolism, he attracted attention by the discovery of a fat-splitting ferment in the stomach. Volhard was born in Munich. After graduation in medicine, he joined the faculty of the University of Giessen and became director of the municipal hospitals in Dortmund and Mannheim, and ordinarius in Halle in 1918, whence, in 1927, he removed to Frankfort-on-Main.

The First Appendicectomy

Prof. Hermann Kümmell, surgeon of Hamburg, celebrated his eightieth birthday, May 22. Kümmell was the first surgeon in Germany to perform the well known appendix operation (in 1889). He likewise pointed out ways for the elimination of cancer, for combating tuberculosis, and for the recognition of unobserved injuries of the spinal column. His researches have aided also in the spread of antisepsis and asepsis. He devoted himself primarily to surgery of the abdominal cavity and to disorders of the kidneys and of the urinary system. The handbook of surgery published by Kümmell in collaboration with Bier and Braun is known the world over.

Multiple Sclerosis as an Infectious Disease

According to an address delivered by Dr. Steiner of the Heidelberger Psychiatrische Universitätsklinik, at a meeting of the Aerztlicher Verein in Frankfort-on-Main, the former conceptions of the origin of multiple sclerosis are no longer tenable. Multiple sclerosis must now be regarded as an etiologically uniform chronic infectious disease of the central nervous system and belongs to the large group of encephalitides. By a new method, Steiner demonstrated the presence of parasites in sections of tissues in seven out of thirty-five cases of multiple sclerosis. In comparison with dementia paralytica and in analogy with it, in multiple sclerosis scientific proof demands a case in which there is an abundance of spirochetes. This postulate has recently been fulfilled by Steiner. Steiner presented diapositives and microscopic preparations derived from a case of multiple sclerosis in which, after a twelve year remission, the patient died during an acute secondary attack that lasted three months.

Experimental Production of Articular Rheumatism

Before the Berliner Medizinische Gesellschaft, Professor Gudzent demonstrated recently rabbits in which, for the first time, it had been possible to produce, experimentally, articular rheumatism by the injection of protein-containing extracts of food products or, in some instances, by the injection of the food products themselves. The resulting inflammation of the joints was, as Gudzent showed, in its clinical course identical with articular rheumatism in man. A precondition, however, is that the animals be made allergic by previous treatment with these substances. These observations furnish important support for Gudzent's view, which he reached on the basis of clinical manifestations in man, that one type of articular rheumatism in man is to be regarded as an allergic reaction to the effects of inactive antigens. Further research will be necessary to discover the causal relation of these antigens to the various forms of articular and muscular rheumatism and to all other disorders designated in human pathology as of rheumatic origin.

VIENNA

(From Our Regular Correspondent)

May 8, 1932.

The Significance for Man of Paratyphoses in Animals

Paratyphoid is a disease that, while it resembles in its course abdominal typhoid, is not produced by genuine typhoid bacilli though by a similar organism: paratyphoid bacilli. As Dozent Dr. David, of the Tierärztliche Hochschule in Vienna, recently brought out, the conception "paratyphoid" has been extended so as to include meat poisoning in man caused by Bacterium enteritidis, which resembles closely the paratyphoid bacillus. Recent researches have shown that in many animals similar processes develop, which are now fairly well known, being termed "paratyphoses." Certain types of paratyphoid bacilli are found chiefly in man; other types mainly in animals, and still others in both man and animals, as causative agents of disease. The paratyphoses of animals, which are of importance to man, are connected with the epidemiology of the so-called food poisonings. These, for the most part, are caused by bacteria of the paratyphoid-enteritis group. The usual mode of infection is that the meat or the milk of animals with diseases due to specific organisms is used for human consumption. Professor Gärtner, in 1888, demonstrated that the bacilli from the flesh of a cow and from the spleen of a man who had been taken sick and had died after eating such meat were identical (Bacillus enteritidis Gärtner), and that they were closely related to the Schottmüller human paratyphoid bacillus. Also the milk of cows so diseased produced gastro-enteritis in man. The most important paratyphoses of animals are infectious abortion of horses and sheep, typhoid of young pigs (similar to human typhoid), not to be confused with hog cholera; typhoid of calves, typhoid of chickens and "chick dysentery," and typhoid of mice and rats. The hygienic importance of these disorders for man is apparently slight, but nevertheless acute cases of gastro-enteritis in man have been traced to animals. Much more dangerous for man, however, are the paratyphoses of adult cattle and sheep, because they furnish disease-producing milk and meat. They may function also as carriers of bacilli and thus infect their stall-mates, even after they have recovered. Most meat poisonings have their origin in the meat of adult cattle or sheep affected with enteritis. (In Westphalia, more than 2,000 persons became ill following ingestion of the meat of sheep suffering from intestinal disease.) Especially dangerous for man are the mild forms of paratyphosis in which clinically there is scarcely any evidence of disease, so that the meat or the milk is used as food without thought of danger. Direct contagious infection of man with such paratyphoses has not been observed. Interest attaches to reports of disorders following ingestion of goose meat and goose liver, while Scott has reported from England seven epidemics of enteritis in man, which were caused by eating duck eggs (during the period 1928-1931). Also the so-called fish poisonings appear to be caused, for the most part, by paratyphoid-enteritis bacilli. In Kiel and Lübeck (Germany), 300 persons became ill a few years ago, following ingestion of smoked mackerel, during which outbreak both the Gärtner bacillus and the closely related Breslau bacillus were found. It appeared that the infection was due to contamination of the fish by infected water or during transit. The prophylaxis of poisonings resulting from eggs, poultry and fish must be left, for the present, to the consuming public, thorough cooking offering the best protection. For the prevention of the transmission of paratyphoses by slaughtered animals, however, there are, in many countries, laws that must be observed by supervising veterinarians. In Austria, the law requires that every animal, before it is slaughtered, must be examined by a veterinarian; but since the clinical and the anatomic-pathologic examinations do not suffice, in 1912 a bacteriologic examination of meat destined for human consumption was introduced, which must be carried out when-

ever there is a suspicion that the meat of a given animal might give rise to poisonings. This provision applies to animals that, before slaughtering, show evidence of an impaired general condition without recognizable cause, or if there is a suspicion that septicemia or some similar condition exists. If an examination of an animal appears indicated, specimens of the muscular tissues, lymph glands, spleen, kidneys and liver must be examined bacteriologically, in the usual manner. If examination of these specimens does not show that the meat is wholesome for man, the whole animal carcass must be destroyed. That Austria has not suffered from any extensive outbreaks of this nature, in recent years, is doubtless due to this precise inspection system.

Electrosurgery in Sarcomas

At the same session, Dozent Dr. Mandl discussed the advantages of electrocoagulation in operations on malignant tumors. At the moment of the electrical incision or the coagulation of the tissues, the blood vessels and lymph paths are closed and thus dissemination is prevented. The operative field is sterilized by the heat, and hemorrhage and shock are only slight. The tissue-preserving action of the electrosurgical procedure is especially marked in cases that, with ordinary surgical therapy, would require "amputation" or extirpation. This is due to the fact that the electric knife effects such a demarcation between healthy and pathologic tissue that it is possible to remove radically the tumor tissue. Dr. Mandl presented three cases of this kind: The first patient, a woman, had undergone subperiosteal enucleation and resection of the ulna on account of a myelogenic sarcoma. The operation dated back three years, roentgen after-treatment having been given. A recurrence developed six months later. The tumor grew rapidly toward the soft parts and toward the radius. The patient refused amputation of the lower arm, which was considered necessary. The ulcerated tumor was given electric coagulation treatment by Mandl, and there remains only the radius with a few ligaments. The wound is diminishing rapidly in size without Thiersch flaps. A year after the operation the patient is able to work and has had no recurrences. The second patient presented a large sarcoma of the right scapula. An opening was made with the electric knife and all the tissues up to the healthy area were coagulated; the flap was put back in place and sutured. The wound healed rapidly. The third patient suffered from spindle-cell sarcoma involving the whole medial portion of the foot, far into the plantar area and the dorsum pedis. Following electrical excision and coagulation into the healthy tissues, rapid healing took place; in this case a Thiersch flap was used. There was rapid general recovery. No patient has had a recurrence as yet, although, to be sure, only six months has elapsed.

General Irradiation with Roentgen Rays in Polycythemia

At a recent meeting of the Gesellschaft der Aerzte of Vienna, Prof. Dr. Sgalitzer presented a woman patient, aged 60, who four years previously had been affected with a severe polycythaemia rubra, having presented 9,500,000 erythrocytes, more than 15,000 leukocytes, prostration, headache, dizziness and incapacity for work. At that time local irradiations of the osseous system were given, but without success. High doses were employed, which were expensive from the standpoint of time and material and thus were impracticable. Sgalitzer decided, therefore, to employ in this case general irradiation, as recommended by Professor Teschendorf for leukemia, since this method had given him better results (longer interval) in leukemic patients than he had secured from local irradiations. General irradiation is applied by Sgalitzer in a specified manner, a filter of heavy metal being used alternately, from the dorsal and the ventral body surface, on five or six successive days. There follows then a longer interval with exact control of the blood picture, in which the leukocytes should receive special consideration, as they diminish more rapidly than the erythrocytes. The leukocytes should not be allowed to drop below 3,000-4,000. If that does occur, a longer interval must be taken. It will be seen that the recovery of the white blood corpuscles requires only a short time (from six to twenty days). Patients react in varying degrees to general irradiation. Often from five to six irradiations suffice, while, in other instances, many times that number are required. Also the by-effects after the irradiation vary in intensity and quality, though often they are entirely absent. Erythrocythemia is favorably influenced by general irradiation. The number of red blood corpuscles drops rapidly; the subjective symptoms disappear over a long period, so that the unfavorable prognosis that existed before the introduction of roentgen therapy may now be regarded as fairly good. The patient presented was practically cured at the end of two months and has had no remissions during the past four years, whereas local irradiation had often been applied without effect. Also in other cases, which to be sure have not been under observation so long, favorable results have been achieved. While it may not be justifiable to speak as yet of an actual cure, at least long remissions have been brought about. In one case, a recurrence treated with a repeated irradiation soon resulted in a normal blood picture. During the discussion that followed this demonstration, many authors who had had an opportunity to try the method emphasized its usefulness and its superiority over older forms of therapy (spleen diet, local roentgen or radium irradiation).

RIO DE JANEIRO

(From Our Regular Correspondent)

May 15, 1932.

A New Species of Blastomyces

Before the Sociedade de Medicina of Pernambuco, Dr. J. Lobo recently delivered an address on blastomycosis in which he reported on a patient of Recife, aged 48, who presented a dermatosis of nineteen years' duration. The lesions consisted of a large number of either isolated or confluent nodules, ranging in diameter from a pin's head to about 15 mm., at the sacral region. The nodules, which were resistant to pressure, hard on palpation and of a chestnut color, had a white point at the top. Neither ganglionic nor perinodular inflammatory reactions were observed. The nodules oozed a thick pus, which microscopically showed a large number of round micro-organisms, regular in size and covered by a double membrane. The organisms wandered among the leukocytes. They were smaller than Coccidioides immitis, had granulations inside their bodies, and showed brownian movement. A part of the lesion was removed by biopsy and cultures were made with these tissues with Sabouraud's medium. The morphologic characteristics of the organism were identified by Goodpasture and MacCallum's staining methods, and the speaker concluded that the patient had blastomycosis caused by fungi other than those previously described as causal agents of the disease. He based his assertion on the following facts: The disease developed as a nodular dermatosis, starting at the sacral region, and followed a slow evolution during nineteen years without greatly affecting the patient's general condition. The culture tubes showed on the third day an ivory-white colony with concentric circles, and with a central elevation formed by aerobic hyphae. The microscopic characteristics of the organism were those of either septate or branched mycelia, with some resistant forms of chlamydospores. The subcutaneous and testicular inoculation made with the pus and the cultures of the infected material into the guinea-pigs gave negative results. A study of the lesions proved the presence of an inflammatory granuloma with primary cellular reaction, especially for the presence of hyaline tissues, with a large number of parasites wandering among the cells and inside the gigantocytes. A study of the parasites

showed the presence of developing forms with chromatic granulations inside the parasitic structures. The author concluded that the organism identified is a new species of blastomyces. Large doses of potassium iodide did not produce satisfactory results.

Bacilli of the Proteus X Group

Dr. Arlindo de Assis, head of the Hospital São Sebastião, of Rio de Janeiro, has published an article on the power of fermentation of the bacilli of the proteus X group on several mediums. It has been stated that Proteus X Kingsbury is unable to produce acid in saccharose and maltose mediums and to produce indole in peptone-water, while Proteus X 19 and X 2 have a strictly opposite behavior. The author investigated the behavior of bacilli of the proteus X group, using a technic which when previously used, to investigate the behavior of Bacterium dysenteriae, had given results showing the slightest changes in the reaction. The author made tests with H colonies and O colonies of each strain of Proteus X Kingsbury, Proteus X 19 and Proteus X 2, while colonies were obtained from the Lister Institute. The fermentation tests were made by using Hiss-serum-water medium to which phenol red had previously been added as an indicator. In the tests, which lasted for seventy days, dextrose, lactose, maltose, saccharose, mannitol and dulcitol mediums were used, and the cultures were kept at a temperature of 75 C. (167 F.). Proteus X 19 and X 2 proved to produce both acid and gas in the dextrose medium and acid in the saccharose and maltose mediums, while mannitol, dulcitol and lactose mediums remained free from acid, although a definite alkaline reaction could be detected in the lactose medium when it was 10 or 12 days old. Bacilli proteus X 19 and X 2 rapidly fermented saccharose; the cultures became acid and clotted early in about twenty-four hours of incubation. On the contrary, the acid production on maltose under the effect of the bacilli was permanently poor and the medium remained fluid during the entire length of the experiment. The group of Proteus X Kingsbury did not have any effect on lactose, mannitol, dulcitol and maltose mediums. However, it caused rapid fermentation with production of gas on the dextrose medium and a marked acid reaction of slow development on the saccharose medium in about seven days, which was more noticeable during the following days and was not associated with the production of gas. The acid reaction occurred earlier with bacilli of the O Kingsbury type than with those of the H Kingsbury type. Subcultures derived from saccharose cultures after an incubation of seventy days proved to have a power of fermentation, especially for saccharose medium, causing the clotting of the saccharose medium after twenty-four hours of having been made, but they have no effect on the maltose medium. The subcultures derived from maltose cultures after an incubation of seventy days proved to have a power of fermentation on saccharose medium and not on maltose medium. Bacilli of the proteus group X 19 and X 2 have a strong power of fermentation on maltose medium. Bacilli of the Proteus Kingsbury strain may have the same power of fermentation that Proteus X 19 and X 2 have on saccharose but not on maltose. The indole production was definitely absent from the cultures made with Proteus X Kingsbury, while it was present in the cultures made with the other two strains of bacilli (Proteus X 19 and X 2).

Evidence of Filtrable Forms of Tubercle Bacilli

Drs. G. Pacheco and P. de Toledo Artigas of São Paulo recently delivered lectures before the Sociedade de Biologia of São Paulo on their experiments for the demonstration of filtrable forms of tubercle bacilli in filtrates of tubercle bacilli cultures, subjected to a special technic of bacterial concentration. The authors used in their work Zeitz sterilized plaques and Chamberland L_1, L_2, L_3 and L_5 porcelain filters. The cultures used in their experiments were of bovine tuberculosis (stock given by the firm of Vallée) and developed in Sauton's medium. As control bacilli, Brucella abortus and Pasteurella aviseptica were used. The glass apparatus used during the experiments were all new and subjected to the action of chromium sulphate. The stains used were previously controlled. The filtrates were planted in broth and they did not cause the development of cultures. The examination made in six filtrates in Zeitz plaques gave positive results in four cases, by proving the presence of acid-fast forms of bacilli in the filtrates. Positive results were also obtained when the filtrates were passed through the Chamberland filters L_1 and L_3.

NETHERLANDS

(From Our Regular Correspondent)

May 18, 1932.

Medicine as Promoter of Peace Between Nations

At the recent meeting of the Nederlandsche Laatschappij tot verordering der Geneeskunde, which comprises the majority of the physicians of the Netherlands, several speakers brought out in their addresses that the spirit of medicine tends by its very nature to promote peace between nations. Taking up this principle, Dr. Roorda pointed out the dangers and the atrocities to which not only the combatants but also the noncombatants were subject, and emphasized that physicians could suppress in a measure the war instinct. Burger brought out that it is not so much the dangers of war itself that depress the spirit of mankind as it is the disturbance of economic and psychologic relations as after-effects of a great war. The medical associations of small neutral countries contribute readily toward the confirmation of peace but it is much more difficult to secure the support of those that participated in the war. Posthuma thinks that, from the medical point of view, physicians can admit their inability to cope with certain dangers from war gases, not only from the preventive but also from the therapeutic point of view, and thus support a strong movement to do away with this means of aggression. An organization has been established bearing the name of Oorlogsprophylaxis, which has already manifested its activity by addressing a series of tracts in English, German, French, Dutch and Esperanto to all the medical associations of the world.

A Bill Pertaining to Radiologic Installations

Article 143 of the law pertaining to higher education stipulates that the doctor's diploma confers on the physician the right to practice medicine in all its branches. Article A of a pending bill pertaining to radiologic installations restricts the application of article 143, for it provides that henceforth only those who shall have received permission to install radiologic apparatus may practice this branch of medicine, and furthermore, a physician must furnish evidence of his competence. In case the university should desire to furnish a diploma as an indispensable condition for the securing of authorization, the question arises as to whether it would not be well to make reference to that fact in the law. A general authorization might be accorded to physicians and dentists, but then only for the examination of the jaws. As to the surgeon-dentists, who have had only an incomplete training in dental medicine and surgery, such competence is not granted to them. It would be well, therefore, to be circumspect in the consideration of this bill, which may involve the principles of medical education.

The Crusade Against Rheumatism

The conclusions of the commission appointed to deal with the crusade against rheumatism, which was under the chairmanship of Dr. P. Ruitinga, are as follows: Four per cent of the population is affected with rheumatism, 1.5 per cent of whom may be treated by physical therapy, whereas for the remaining 2.5 per cent (muscular rheumatism and lumbago) such treatment is useless. The institute of physical therapy at Amsterdam treats annually 2,500 patients suffering from

rheumatism. The commission considers the erection of hospitals necessary if the departments of physical therapy in the existing hospitals are not well organized. In order that the crusade against rheumatism may be complete, it will be necessary to establish consultation centers where the cause in each case can be ascertained. From these centers, the patients could be sent to the clinics or to institutes. For the transportation of patients with grave rheumatism, a special automobile service should be organized. The problem of the expansion of physical therapy in the broad sense (that is, also for nonrheumatic disorders) is partly solved. But before taking any definite position it would be desirable to see in what direction the consultation centers should develop physical therapy in the more intensive crusade against rheumatism.

Discussion on Dental Caries

At the thirty-sixth Congress on the Organization of Public Health, the chief topic on the program was "The Surgicodental Treatment of the Various Classes of the Netherlands' Population," as presented by the dentists P. J. J. Coebergh of Utrecht, H. Van der Molen and Professor Heringa. Some points brought out were that there is general agreement on the value of careful hygiene of the mouth but that one should not exaggerate the need. There is not always agreement, because of the varying conceptions of the disorder, on how to prevent caries. According to some, particles of food adherent to the teeth ferment, dissolve the enamel and become the port of entry for bacteria that cause caries. According to other authorities, dietary errors in the young child, and resultant defects in the composition of the teeth, cause the teeth to be more easily subject to caries. The next question that arises is at what age dental prophylaxis should be instituted—in preschool children or in school children; with reference to the deciduous teeth or to the permanent teeth. The general opinion is that one should begin with the lower classes in school. Then, again, where should the policlinic be located? On this point opinions differ. Some think a center could be made to serve several schools. Who should examine the children? The examination of the teeth, the dentists think, should be entrusted to nurses who have taken a short course in dentistry. In addition to dental surgery in the school, the question of dental surgery for young persons who have left school was discussed, and also for older persons. The cost of dental care would be high, but not so high for those whose teeth had received preliminary care in the schools. Dental surgery should aim to become preventive.

Marriages

EDWARD MITCHELL VAUGHAN, Middletown, Del., to Mrs. Eva Sykes of Millington, Md., at Wilmington, Del., June 4.

HUGH B. BROWN, Abingdon, Va., to Miss Mary Evelyn Jones of Bristol, Tenn., February 23.

EGBERT L. MORTIMER to Miss Caroline Bushnell Lucius, both of Baltimore, June 18.

JOHN HARLAN HORNBAKER, Baltimore, to Miss Elizabeth Gilbert Chaffinch, June 23.

LESLIE S. WHITAKER to Miss Georgia E. Taylor, both of San Jose, Calif., June 25.

DON MARSHALL, Amherst, Mass., to DR. EVELYN M. WEEKS of Baltimore, June 27.

CHARLES SOLMS, New York, to Miss Helen Rowe Purdum of Baltimore, June 30.

JOHN MURRAY STEELE to Miss Sylvia M. Ward, both of New York, July 1.

ALEXANDER WIENER to Miss Gertrude Rodman, both of Brooklyn, June 30.

CONRAD A. MIETUS to Miss Helene M. Bartczak, both of Buffalo, June 30.

Deaths

George Arnold Moleen ⊕ Denver; Gross Medical College, Denver, 1900; Secretary of the Section on Nervous and Mental Diseases, 1912-1915, and Chairman, 1915-1916, American Medical Association, and member of the House of Delegates, 1917-1918; professor of neurology, University of Colorado School of Medicine; member of the American Neurological Association, American Psychiatric Association, and the Association for Research in Nervous and Mental Diseases; member and past president of the Central Neuropsychiatric Association, the Denver City and County Medical Society and the Denver Clinical and Pathological Society; on the staffs of the Colorado General, Denver General, Mercy and Children's hospitals, and the National Jewish Hospital for Consumptives, Denver; consultant in neurology, Swedish National Sanatorium for Tuberculosis, Englewood; editor of *Colorado Medicine*, 1906-1910; aged 55; died, June 22, of heart disease.

Joseph Leidy ⊕ Penllyn, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1887; assistant demonstrator of pathology, anatomy and morbid histology in 1892 and anatomy in 1893 at his alma mater; member of the American Association of Anatomists; delegate to the International Congress of Hygiene and Demography at Paris in 1900; during the World War he served with the rank of lieutenant colonel as medical director and instructor of gas defense for the thirtieth division of the U. S. Army; formerly physician to the University Hospital, Pennsylvania General Hospital and the Pennsylvania Hospital for Insane, Philadelphia, and the medical clinic of the Pennsylvania Hospital; surgeon to the Howard Hospital, the Hamilton and Philadelphia dispensaries; aged 66; died, July 6, of heart disease.

Emil G. Beck ⊕ Berkeley, Calif.; College of Physicians and Surgeons, Chicago, 1896; member of the Illinois State Medical Society, the Western Surgical Association, the American Association of Thoracic Surgery, the American Roentgen Ray Society, Radiological Society of North America and the American Radium Society; fellow of the American College of Surgeons; in 1923 received from the American Roentgen Ray Society a gold medal in recognition of original work in stereoroentgenography; brother of Drs. Carl and Joseph C. Beck; author of "Chronic Suppurations—Treatment by Bismuth Paste;" aged 66; formerly director of the North Chicago Hospital, Chicago, and on the staff of the Merritt Hospital, Oakland, Calif., where he died, July 1, of cerebral hemorrhage.

John Alling Card ⊕ Poughkeepsie, N. Y.; New York University Medical College, New York, 1898; member of the House of Delegates of the American Medical Association, 1929, 1930 and 1931; formerly councilor of the first district of the Medical Society of the State of New York; speaker of the house of delegates of the Medical Society of the State of New York; past president of the Dutchess-Putnam Counties Medical Society; for fifteen years coroner of Dutchess County; attending pediatrician to the Vassar Brothers Hospital; consultant pediatrician to St. Francis and the Bowne Memorial hospitals; chairman of the committee on publication of the *New York State Journal of Medicine;* aged 56; died, June 28, in the Sadlier Hospital, of nephritis and myocarditis.

John Wesley Andrews, Mankato, Minn.; Rush Medical College, Chicago, 1877; Bellevue Hospital Medical College, New York, 1880; an affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; past president of the Minnesota State Medical Association and the Blue Earth County Medical Society; at one time member of the state board of medical examiners; formerly state senator, member and president of the board of education, and mayor of Mankato; on the staffs of the Immanuel and St. Joseph's hospitals; aged 83; died, May 16, of senile aplastic anemia.

Jonathan Leaming Wiggins, San Diego, Calif.; St. Louis Medical College, 1877; member and past president of the Illinois State Medical Society and St. Clair County Medical Society; fellow of the American College of Surgeons; member of the Illinois Department of Registration and Education, 1919-1920; former member of the board of education of East St. Louis, Ill.; at one time on the staffs of the Deaconess Hospital and St. Mary's Hospital, East St. Louis; aged 77; died, May 28, of heart disease.

Earl Perkins Lothrop ⊕ Buffalo; Niagara University Medical Department, Buffalo, 1894; fellow of the American College of Surgeons; past president of the Buffalo Academy of Medicine and the Medical Society of the County of Erie, on the staffs of the Millard Fillmore Hospital, Buffalo, J. N. Adam Memorial Hospital, Perrysburg, N. Y., and the Columbus Hospital, New York; aged 61; died, June 9, of acute mastoiditis.

Walter Murray English, Brockville, Ont., Canada; Victoria University Medical Department, Coburg, 1886; at one time emeritus professor of sanitary science, University of Western Ontario Medical School, London; member and past president of the American Psychiatric Association; formerly medical superintendent of the Ontario Hospital; aged 70; died, May 19, in Oxford, England.

Thomas Jefferson Smith, Bridgeton, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1866; member, past president and vice president of the Medical Society of New Jersey; past president of the Cumberland County Medical Society; formerly medical director of the Cumberland County Hospital for the Insane; aged 91; died, June 14, of pneumonia.

Guy Glenn Giffen ⊕ Dayton, Ohio; Ohio-Miami Medical College of the University of Cincinnati, 1911; member of the American Urological Association; formerly secretary of the Montgomery County Medical Society; served during the World War; aged 43; on the staff of the Miami Valley Hospital, where he died, June 17, of metastatic lymphoblastoma.

Oren Judson Waters, Chicago; Jefferson Medical College, Philadelphia, 1891; member of the Illinois State Medical Society; fellow of the American College of Surgeons; assistant professor of (extramural) surgery, Northwestern University Medical School; on the staff of the Passavant Memorial Hospital; aged 74, died, June 25, in Milwaukee.

Edgar Martin Freese ⊕ Columbus, Ohio; Starling-Ohio Medical College, Columbus, 1908; fellow of the American College of Surgeons; on the staffs of the Grant Hospital, St. Francis Hospital and the White Cross Hospital; aged 45; was accidentally shot and killed, June 13, at a ranch near Medora, N. D., while cleaning a revolver.

Starling Sullivant Wilcox, Columbus, Ohio; Starling Medical College, Columbus, 1888; member of the Ohio State Medical Association, and fellow of the American College of Surgeons; for ten years district head of the U. S. Veterans' Bureau in Columbus; surgeon to the Grant Hospital; aged 67; died, June 1, of cerebral hemorrhage.

John Joseph English, Troy, N. Y.; Medical Department of the University of the City of New York, 1893; served during the World War; chief medical inspector in the Troy Public Schools; for many years on the staffs of the Troy Hospital and St. Joseph's Maternity Hospital; aged 64; died, June 12, of heart disease.

Philip Kilroy ⊕ Springfield, Mass.; Harvard University Medical School, Boston, 1888; member of the Association for Research in Nervous and Mental Diseases; formerly on the staffs of the Springfield Hospital and the Mercy Hospital; aged 66; died, May 24, of coronary thrombosis and chronic myocarditis.

John Marcus Fox, Minneapolis; Minneapolis College of Physicians and Surgeons, 1901; member of the Minnesota State Medical Association; formerly member of the board of health and board of education of Osseo; aged 56; died, May 7, of cerebral hemorrhage and hypertension.

Thurman Alson Hull ⊕ Troy, N. Y.; Albany (N. Y.) Medical College, 1905; member of the American Roentgen Ray Society; for six years county coroner; formerly on the staff of the Samaritan Hospital; aged 52; died, June 20, in the Albany Hospital, of angina pectoris.

William Henry Rabberman ⊕ Forest, Ohio; Starling Medical College, Columbus, 1906; served during the World War; member of the board of education; on the staff of the McKitrick Hospital, Kenton; aged 57; died, June 4, at Dayton, of chronic myocarditis.

Addley Hogan Gladden, Monroe, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1888; formerly member of the state board of health; served during the World War; aged 66; died, June 8, of chronic nephritis.

Sterling Price Holland, Blakely, Ga.; Medical Department of the Tulane University of Louisiana, New Orleans, 1908; member of the Medical Association of Georgia; aged 51; died, May 29, in a hospital at Dothan, Ala., of angina pectoris.

Frederic John Haas ⊕ Leavenworth, Kan.; University Medical College of Kansas City, 1907; member of the American Academy of Ophthalmology and Oto-Laryngology; aged 56; died, June 7, of cerebral embolism and bilateral phlebitis.

William Francis Meagher, Hartford, Conn.; University of Vermont College of Medicine, Burlington, 1899; member of the Connecticut State Medical Society; aged 65; died, June 9, of arteriosclerotic heart disease.

Samuel C. Waters ⊕ Middletown, Ind.; Starling Medical College, Columbus, Ohio, 1881; past president of the Henry County Medical Society; aged 71; was found dead in his office, June 22, of cerebral hemorrhage.

Frank Allen Hubbard ⊕ Taunton, Mass.; Medical Department of the University of the City of New York, 1878; on the staff of the Morton Hospital; aged 80; died, June 21, of arteriosclerosis and angina pectoris.

Thomas Tass Fyfe, Greenfield, Mass.; Homeopathic Hospital College, Cleveland, 1889; aged 72; on the staff of the Franklin County Public Hospital, where he died, June 1, of a staphylococcus infection.

Frederick Henry Eames, Watertown, Mass.; Medical School of Maine, Portland, 1892; aged 72; died, June 15, in the New England Deaconess Hospital, Boston, of cardiorenal disease and uremia.

Alfred J. Abbott, Albion, Mich.; Rush Medical College, Chicago, 1882; past president of the Calhoun County Medical Society; health officer of Albion; aged 70; died, June 21, of heart disease.

Wilfrid Aurelien Morais, Fall River, Mass.; Tufts College Medical School, Boston, 1927; member of the Massachusetts Medical Society; aged 31; died, May 15, of pulmonary tuberculosis.

Otho Marion Ford, Rockford, Ill.; Chicago College of Medicine and Surgery, 1908; member of the Illinois State Medical Society; aged 51; died, June 14, of an overdose of morphine.

Heinrich August Habenicht ⊕ Des Moines, Iowa; American Medical Missionary College, Chicago, 1899; on the staff of the Iowa Methodist Hospital; aged 60; died, June 6, of aortic stenosis.

Herman Samuel Schulz ⊕ Bridgeport, Conn.; Hahnemann Medical College and Hospital of Philadelphia, 1901; aged 52; died, June 7, of chronic myocarditis and acute dilatation of the heart.

Duncan Nevan Carmichael, Peterborough, Ont., Canada; Faculty of Medicine of Trinity College, Toronto, 1884; L.R.C.P., Edinburgh, Scotland, 1884; aged 77; died, April 13.

Arthur W. Scott, San Francisco; University of California Medical Department, 1879; aged 75; died, April 15, in St. Francis Hospital, of cerebral hemorrhage and diabetes mellitus.

Thomas W. Hail, Denver; Gross Medical College, Denver, 1898; aged 68; died, May 25, in the Presbyterian Hospital, of malignant endocarditis and acute hemorrhagic nephritis.

Harry Kent Bell, Port Chester, N. Y.; Long Island College Hospital, Brooklyn, 1884; aged 75; died, June 12, in the United Hospital, of heart disease and nephritis.

Walter Edward Smith ⊕ San Francisco; Toledo (Ohio) Medical College, 1912; aged 49; died, April 24, in St. Joseph's Hospital, of pneumonia and duodenal ulcer.

Josephine Howland, Union Springs, N. Y.; Woman's Medical College of Pennsylvania, Philadelphia, 1895; aged 79; died, June 2 of cerebral hemorrhage.

Caesar S. Bassett, Hampton, Va.; Leonard Medical School, Raleigh, N. C., 1906; aged 54; died, May 24, of pulmonary embolism following an appendectomy.

William Jackson Smith, Sperryville, Va.; Jefferson Medical College of Philadelphia, 1886; aged 70; died, May 1, of chronic myocarditis and nephritis.

John Clifton Pearson, Phillipsport, N. Y.; University of Vermont College of Medicine, Burlington, 1885; aged 75; died, May 26, of chronic myocarditis.

Gustavus Adolphus Gissy, St. Louis; Beaumont Hospital Medical College, St. Louis, 1897; formerly a druggist; aged 65; died, June 3, of heart disease

George B. Klump ⊕ Williamsport, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1897; aged 58; died, May 26, of pneumonia.

George W. Lambley, Ainsworth, Neb.; College of Physicians and Surgeons, Keokuk, Iowa, 1883; aged 71; died, May 16, of cerebral hemorrhage.

Jerry E. Brainard, Superior, Neb.; Homeopathic Hospital College, Cleveland, 1889; aged 67; died, May 15, of chronic interstitial nephritis.

Edwin Clarence Rogers ⊕ Wapello, Iowa; Keokuk (Ia.) Medical College, 1898; aged 59; died, May 30, of a self-inflicted bullet wound.

George Stromer, Broussard, La.; College of Physicians and Surgeons, Baltimore, 1891; aged 71; died, May 8, of pneumonia.

Edwin John Lauber, San Leandro, Calif.; Toledo Medical College, 1909; aged 47; died, June 2, of heart disease.

Bureau of Investigation

SCOT TISSUE

The Use of Pseudo-Science and the Fear Complex In Breaking Down Sales Resistance

There are fashions in advertising. In the mauve decade the mere mention of certain personal and intimate features of life was considered an offense against good taste—and, naturally, it had no sales appeal. Even the most brazen advertisers—the "patent medicine" exploiters—set certain empirical limits beyond which it appeared, if not indecent, at least commercially unwise to venture. Today, there is little that is too intimate or too delicate to be emblazoned on the advertising pages of the metropolitan dailies and the national weeklies or monthlies. The daring advertisements of yesterday—of boudoir unmentionables and what-not—have been replaced today by advertisements of bathroom accoutrements for masculine or feminine hygiene, sanitary pads which induce radiance on the part of the wearer, and toilet paper—all coupled with a health appeal!

Science finds Harmful Acids...*Mercury*...*Arsenic* in many brands of Toilet Tissue

660 Brands tested...2 out of 3 found "Unsafe...unfit to use"

SCOTTISSUE AND WALDORF ARE SOFT, ABSORBENT TISSUES...MEDICALLY SAFE...APPROVED BY DOCTORS, HOSPITALS AND HEALTH AUTHORITIES

Photographic facsimile of a full-page advertisement of Scott Tissue. The original was 11 inches by 14 inches in size.

In keeping with the tendencies of the times, the styles of advertising toilet paper have changed. At first the emphasis was on quantity and price or other features which might have practical bearing. Then came the vogue of pastel colors to match the walls or porcelain equipment of the bathroom. The aesthetic appeal naturally included emphasis on softness. These appeals, however, lacked the scientific or health element, the aspect that simply must be found to make the advertising of tissue paper abreast with the advertising of tooth pastes, mouth washes, and pseudo-scientific toilet prerequisites.

The urge to overdo is no better exemplified than in the recent exploitation of Scot Tissue toilet paper. In order that one may appreciate to what extent of refinement and nicety the promoters of this commodity have gone, let it be stated that Scot Tissue paper is now advertised as being "chemically pure" —though for what reason it should be so pure is not obvious. "Soft as old Linen" reads the label on one of these utilitarian rolls. It is further defined as being "The absorbent soft white toilet tissue . . . medically safe . . . approved by doctors, hospitals and health authorities." In recent months, the concern has reverted to "Science"—with a capital S—to aid it in its efforts to inform the public of the absolute safety of these absorbent rectal-health tissues. Nor is medicine the only branch of science that is butchered to make an advertising holiday. Chemistry, with its traditions of unraveling deeply-shrouded mysteries, is also dragged into the picture. The advertising agency of the Scott Paper Company, evidently realizing the possibilities of chemical examination, set forth to have "research" done in a "nationally-known laboratory."

The advertisements giving the results of this "investigation" may be counted on to arouse the necessary amount of fear on the part of the toilet-paper-using public—a no small audience, Chic Sale to the contrary notwithstanding. Blazing forth in type that could be read across the street is the warning:

> "Science finds Harmful Acids . . . Mercury . . . Arsenic in many brands of Toilet Tissue."
>
> "660 Brands tested . . . 2 out of 3 found 'Unsafe . . . unfit to use.'"

But the public need not fear if it will but use Scot Tissue or Waldorf, another Scott Paper Company product! And if this appeal is not enough to convince the public that there is a safe way out, there is a peroration:

> "Use only tissues you know meet the standards which physicians approve."

Now, the data for such startling declarations should be easily available—especially as it was declared that "medical science" was back of them. Yet, the organized medical profession was hopelessly in the dark in the matter. In view of this disconcerting fact, the A. M. A. Chemical Laboratory communicated with the Scott Paper Company and put to it a few simple but pertinent questions.

First, since the advertisements had claimed that "medical science recently proved in a hospital laboratory" that two-thirds of the toilet papers on the market were "unfit to use," the Scott Paper Company was asked in what hospital laboratory the work had been done.

Second, since medical literature threw no light on the subject, the company was asked whether a detailed report of the laboratory work was available.

Third, since the advertisements definitely declared that "unsafe quantities" of arsenic and mercury had been found in the condemned two-thirds of the market supply of toilet paper, the A. M. A. Laboratory asked how much arsenic and mercury had been found in the "bad" papers and how these amounts compared with the amounts found in the "good" papers.

Fourth, since the Scott Paper Company urged that the public should use only toilet paper that "conformed to accepted medical standards," it was asked what these standards are—as the medical profession seemed to know nothing about such standards.

The questions, it will be seen, were elemental and such that any reputable concern with nothing to hide or to quibble about should be willing and eager to answer. Yet, through the entire correspondence it has been difficult to obtain definite replies. At the outset, it was necessary to send the same letter twice, the second time by registered mail. About a month after the first letter was sent, the advertising manager of the Scott Paper Company stated:

> "We were very much surprised to receive your letter of March 23, advising us that your letter of February 29 had not yet been answered. In order that the scientific facts of the investigation made of 660 brands of toilet tissue might be accurately given you, we forwarded your letter to the medical college hospital conducting the examination.
>
> "We are forwarding your second letter to them because we know they plan giving you full information about this work, and their letters to you must have gone astray. Thank you for writing us again, and please accept our apologies for the apparent negligence in responding to your inquiry."

Following this, there came a letter from Dr. John A. Killian, Director of the Department of Biochemistry of the New York Post-Graduate Medical School and Hospital, under whose guidance the scientific work was presumed to have been made. As Doctor Killian did not answer the essential points raised in the Laboratory's first communication, this omission was brought to the attention of both the company and Doctor Killian.

Some time later, a representative of the J. Walter Thompson Advertising Agency—which prepared the advertising copy—called at the A. M. A. Chemical Laboratory to discuss a proposed Laboratory report on the advertising of Scot Tissue. During the conversation this representative stated that the Scott

Paper Company had done much to improve the industry as a whole, which was in a better condition now than it had been years ago. He admitted frankly that the advertising was exaggerated; and opined that if advertising was seventy per cent accurate, it was considered quite honest copy—otherwise, it would lack the necessary emotional appeal. When the representative was asked for evidence supporting the statement that the product was made according to the standards of the medical profession, he replied that they had no evidence that this product complies with the "standards of the medical profession." In the previous correspondence, it had been pointed out that the A. M. A. Chemical Laboratory was generally recognized as the standardizing agency for the medical profession; yet, the Laboratory had never suggested nor heard of a standard for toilet paper. The advertising representative was told that the information desired was relatively simple—namely, a quantitative statement of the content of arsenic, mercury, or other chemical compounds alleged to have been found in the toilet papers examined, both in the cheaper and in the equally expensive grades; also, an explanation of the method of determining how much mercury or arsenic compounds were harmful.

Following this visit, Doctor Killian forwarded to the A. M. A. Chemical Laboratory a summary of the analyses of toilet papers made for the Scott Paper Company. The report classified the papers on the basis of such things as ground wood fibers, but did not name the brands nor give the selling price of the papers examined. The report showed that more than fifty-five per cent of the 660 brands examined contained no more wood fibers than were found in Scot Tissue and Waldorf!

Brands were also examined macroscopically for bundles of splinters. In this test Waldorf showed about four bundles per sheet; Scot Tissue showed only about one bundle in fifteen sheets. But there were three brands which had fewer splinters than Scot Tissue and six brands which had no splinters whatever! There were a number of other things, such as ash, etc., which did not appear to be of much interest and for which data were lacking to determine the relative purity of the Scott Paper Company's product.

What the A. M. A. Chemical Laboratory was concerned with mainly was the amount of mercury and arsenic in Scot Tissue and an explanation of how the danger threshold had been arrived at. As nearly as could be determined from Doctor Killian's report, the arsenic determination is summed up in one paragraph:

> "Arsenic was determined by the electrolytic Gutzeit method as described by Osterberg. Arsenic was found in 1.8 per cent of the brands examined, varying from traces (less than 0.01 mg.) to 1 mg. per 100 gm."

As arsenic was found in only 1.8 per cent of the brands examined, this means that out of 660 brands fewer than 12 had *any* arsenic whatever in them. The Scott products contained no arsenic. Even with the maximum amount found—1 mg. to 100 gm.—it strains the imagination to believe that such infinitesimal quantities could be harmful. To help visualize the amount of arsenic found in even those papers which contained the maximum amount, it may be stated that in a toilet paper of the same weight as Scot Tissue, each single sheet would contain not to exceed $\frac{1}{20,000}$ of a grain of arsenic! The statements regarding mercury were equally unsatisfactory. In fact, it was admitted that quantitative analyses for mercury were not made on all the brands examined.

Iron was reported found in the ash of 90 per cent of the brands examined, but the amounts found in the Scott products were not given in the report. As the advertising agency that writes the Scott copy has not yet recommended that company's product for the relief of secondary anemias, it may be presumed that the amount of iron in either Scot Tissue or Waldorf is negligible.

In the letters to Doctor Killian, it was pointed out that it was manifestly unfair to compare a high-priced toilet paper with a cheap one, unless the differences in prices were made part of the report. In the same letters Doctor Killian was asked in what concentrations he would consider arsenic or its compounds to be deleterious or harmful ingredients of toilet paper.

To the first question, Doctor Killian replied that he had no information relative to the price of the various brands, so that it may be presumed that the 660 brands examined were not purchased on the open market by the laboratory that made the examination. On the question concerning the concentrations of arsenic that he considered deleterious or harmful, Doctor Killian replied that from his knowledge of the literature neither he nor, he believed, any one else could answer the question—a conclusion in which THE JOURNAL concurs. Yet, on the basis of the work done by Doctor Killian, the Scott Paper Company have not hesitated to blazon from one end of the country to the other the implied claim that the American public is running risks of arsenic poisoning from the use of some brands of toilet paper!

It is doubtless true that there are cheap toilet papers on the market that should be avoided; it can also readily be admitted that Scot Tissue and Waldorf are high-grade products, but probably no better than many others in the same price field. These facts, however, are no mitigation of the offense of the Scott advertising; making every allowance for what has been euphemistically termed "permissible puffery" in advertising, the recent advertisements of Scot Tissue fall entirely outside the pale. These advertisements are of a type that is all too common today, in which certain facts of little or no importance have been twisted and magnified in order to develop a fear complex on the part of the public.

This fact in itself is sufficient justification for a protest on the part of the medical profession. But this is not all. The Scott concern has dragged in the good name of medicine in an attempt to make the public believe that "medical science" had investigated the toilet paper problem and had found certain samples to contain arsenic, mercury and other substances "in sufficient quantities to cause rectal illness." Neither independent research nor the Scott concern's own investigation have proved any such thing.

Correspondence

DETERMINATION OF NONPATERNITY BY BLOOD GROUPS

To the Editor:—In reply to an inquiry concerning the application of blood groups for the determination of nonpaternity (THE JOURNAL, May 21, p. 1832), you quote the von Dungern and Hirschfeld theory after Ottenberg and Beres, and state: "Although a number of workers have repeatedly confirmed the statements of Ottenberg and Beres, the subject is still one of controversy." As a matter of fact, there is no longer any controversy; and since there has been a good deal of misunderstanding on the question of the application of the Landsteiner blood groups in problems involving blood relationship, I am writing this letter to present the pertinent facts in an attempt to clarify the subject.

As you point out in your reply, von Dungern and Hirschfeld were the first to prove that the agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents (in other words, the agglutinogens A and B are inherited as mendelian dominants). This observation was made in 1910 and was based on a study of a fairly large series of families. Even at that early date, von Dungern and Hirschfeld said: "The fact that the demonstrable substances A and B cannot appear in the children if absent in both parents is forensically available" (Blood Tests for Paternity, editorial, THE JOURNAL, Oct. 2, 1926, p. 1130). This discovery by von Dungern and Hirschfeld has been amply confirmed by many workers in studies involving tens of thousands of children. In studies on 131 families with 642 children, Vaisberg and I failed to find a single exception to the law just enumerated (*J. Immunol.* **20**:371 [May] 1931). In fact, there has never been any controversy about this law, the only controversy having concerned the theory which von Dungern and Hirschfeld proposed to explain their law, as will be pointed out later.

The significance of the law of von Dungern and Hirschfeld may be understood from the first six matings in the accompanying table. Thus, in mating 1, in which both parents

belong to group O (i. e., neither parents possesses any agglutinogen), the children can belong only to group O, for they cannot have either of the agglutinogens A and B. In mating 2, in which one parent belongs to group O and the other to group A, the children can belong only to groups O and A; and so on for the other matings. How this can be applied in an actual paternity case may be illustrated in the following two hypothetical examples: A man charged with the paternity of a child denies ever having had intercourse with the plaintiff, so the blood groups of the man, woman and child are determined. The man is found to belong to group A, the woman to group A, and the child to group B. Since the mother does not possess the agglutinogen B but the child does, this agglutinogen must have come from the father, who could therefore belong only to group B or group AB. The blood groups in this case, therefore, have furnished absolute proof of the man's innocence. Let us suppose, however, that in another similar case the blood groups were as follows: man, group B; woman, group A; child, group AB. As may be seen from the table, such a combination of groups is entirely possible. This, however, is no proof that the man charged with paternity is the true father, for in cosmopolitan populations 15 per cent of all individuals belong to group B. The man in question is no more proved the father of the child than is any other man belonging to the same group. Blood groups, therefore, are of no value as an aid in proving paternity; they can be used in certain cases only to prove nonpaternity.

Heredity of the Landsteiner Blood Groups

	Groups of Parents	Groups of Children Possible	Groups of Children Not Possible
1.....	O + O	O	A, B, AB
2.....	O + A	O, A	B, AB
3.....	O + B	O, B	A, AB
4.....	A + A	O, A	B, AB
5.....	A + B	O, A, B, AB	
6.....	B + B	O, B	A, AB
7.....	O + AB	A, B	O, AB
8.....	A + AB	A, B, AB	O
9.....	B + AB	A, B, AB	O
10.....	AB + AB	A, B, AB	O

In 1925, Bernstein proved that the theory of heredity of blood groups as enunciated by von Dungern and Hirschfeld was inaccurate. He proved from statistical considerations that the factors A and B are not inherited independently of each other as supposed by von Dungern and Hirschfeld, but that their heredity depends on three allelomorphic genes, A, B and R (Bernstein, F.: *Ztschr. f. indukt. Abstammungs- u. Vererbungs.* **37**:237, 1925). This does not change in any way the law formulated by von Dungern and Hirschfeld that the agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents. This law, as has already been pointed out, is amply supported by the work of numerous investigators. In addition to this law, however, according to the Bernstein theory, a group AB parent cannot give rise to a group O child, and a group O parent cannot give rise to a group AB child. This new law gives additional opportunities for the exclusion of paternity, as is shown in the last four matings of the table.

There has been some controversy whether or not this law was correct, because the literature before 1925 contained numerous exceptions to it. These exceptions have been shown to be due to illegitimacy or errors in technic, however (*J. Immunol.* **18**:201 [March] 1930). Since 1925, a large amount of work has been done to determine whether or not exceptions to the new law exist, particularly by Schiff, Thomsen, Snyder, Furuhata and Vuori, none of whom have found a single exception. My associates and I have also made a special study of families in which one or both parents belonged to group AB, and among 218 children found only one group O child, and in this case the possibility of illegitimacy could not be excluded. On the basis of these results, Schiff is applying the blood groups for the determination of nonpaternity in the German courts according to the Bernstein theory (Schiff, F.: Die Technik der Blutgruppenuntersuchung, Berlin, Julius Springer, 1929). And Hirschfeld himself has recently stated that the Bernstein theory more adequately explains the heredity of blood groups than his own theory (*Klin. Wchnschr.* **10**:1910, 1931). Alternative hypotheses, such as the Bauer theory of linkage, are open to the same objections as the original theory of von Dungern and Hirschfeld. In the light of two unexplained exceptions to Bernstein's second law recently found by Haselhorst and Kossovitch, however, it may perhaps be better, for the time being, to use such exceptions only as strong circumstantial evidence of nonpaternity. The exclusions shown in the first six matings, however, may be safely considered absolute evidence of nonpaternity.

So reliable is the determination of nonpaternity by blood groups that in 1929 Schiff succeeded in collecting 5,584 cases in which blood groups had been applied for this purpose in Germany, Austria, Denmark, Sweden and Switzerland (Schiff, F.: *Med. Welt,* 1929, No. 31). At present the Landsteiner blood groups are also being applied in France, Italy and England.

In any case in which the results with the Landsteiner blood groups are inconclusive, tests for the agglutinogens M and N of Landsteiner and Levine should be performed (Landsteiner, K., and Levine, P.: *J. Exper. Med.* **47**:757 [May], **48**:731 [Nov.] 1928. Wiener, A. S.: Blood Tests for Paternity, THE JOURNAL, Aug. 30, 1929, p. 681; *Am. J. M. Sc.* **181**:605 [May] 1931). The original work of Landsteiner and Levine has been amply confirmed by Schiff, by Thomsen and Clausen, and by me, so that the medicolegal application of these agglutinogens is fully justified at present. In fact, Schiff is applying the agglutinogens M and N in Germany (Schiff, F.: *Deutsche Ztschr. f. d. ges. gerichtl. Med.* **18**:41, 1931).

As I have already pointed out, blood groups are of no value for proving paternity; they can be used only to prove nonpaternity. But not in every case in which a man charged with paternity is not the true father can blood groups prove his innocence. For example, if the putative father and the true father belong to the same group, no exclusion will be possible. It has been calculated that a man falsely charged with paternity can be exonerated in approximately one sixth of the cases by means of the Landsteiner blood groups (Determination of Nonpaternity, editorial, THE JOURNAL, Aug. 24, 1929, p. 612). If the blood is examined also for the agglutinogens M and N, the chances of proving nonpaternity are increased to one in three. Another application of the heredity of these agglutinogens is in cases in which new-born infants have been accidentally interchanged in hospitals. More than two thirds of such cases can be solved by the combined use of the agglutinogens A, B, M and N.

ALEXANDER S. WIENER, M.D., Brooklyn.

SURGICAL TREATMENT OF LUNG ABSCESS

To the Editor:—In the report of the paper which I read in Madrid (THE JOURNAL, June 18, p. 2226), there is just one error which should be corrected.

Your reviewer states that I have advised that the first opening of a lung abscess should be in its inferior border, and since this is the very thing which I have stated should not be done, it seems to me that a word of correction might be advisable. All the more so because of the extremely careful abstracting of the remainder of the article. Pulmonary abscesses should be rarely, if ever, primarily drained through their lower border for fear of contaminating uninfected pleura. Full gravitational drainage, if necessary, should be reserved for a later operation.

HOWARD LILIENTHAL, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

RENEWAL OF BODY CELLS

To the Editor:—Do physiologists hold that the entire human body is continuing to renew itself? Lately I read somewhere that a complete renewal occurs every eleven months. But what I want specifically to know is whether every cell in the body dies and is replaced by a new one, once in so often, or whether there are cells that never die as individuals. According to one authority, Conklin, the germ plasm is immortal. That is, it not only persists throughout the life of the individual but is transmitted from generation to generation. Does this mean that its constituent cells are individually immortal? Then, as to the brain cells, if they actually die and are replaced time and again during a person's life, how do they transmit memory impressions to their successors? Perhaps you can recommend some book that will elucidate as well as explain this knotty problem.

C. NORMAN HOWARD, M.D., Warsaw, Ind.

ANSWER.—The cells in the blood, particularly the red cells or corpuscles, are continually being destroyed in the liver and spleen and other places and continually being produced in the marrow of the bone. The surface cells of the skin in man and other mammals are continually dying and shedding and they are being continually replaced through cell division in the deeper skin layers. In the case of blood corpuscles and skin, therefore, there is a continuous destruction and a continuous replacement of tissues. On the other end of the line are the nerve cells and skeletal muscles, of which there is no destruction or replacement normally but actual incapacity of reformation when destruction has been produced or loss of nerve cells or muscle fibers is suffered from any cause whatever. In most of the other tissues of the body, such as the smooth muscle cells, the liver cells, the gland cells or the connective tissue cells, there is little evidence of continued destruction and replacement of cells as a normal process, but there is good evidence on the question of capacity and regeneration or production of new cells by cell division when part of the tissues have been lost or destroyed. This applies also to bone and cartilage. In the case of the germ cells there is, indeed, continued production and continued destruction or loss of ova and sperm. In this respect the ovaries and testes, in more or less continuous production of sperm and ova, behave like the red bone marrow in the life history of the blood corpuscles. It would perhaps be more correct to say that the body is transmitted through the germ cells, from generation to generation, rather than the usual way of putting it that the "germ cells are immortal." The foregoing facts may be studied in any reliable book on physiology or anatomy and histology.

HYDROCEPHALUS AND TAY-SACHS DISEASE

To the Editor:—A young couple had a baby boy, a first child, which developed quite normally until about 7 months of age, when it began to lose weight, became listless and nonresponsive, developed pneumonia and died. During this period, the size of the head had increased. A well known Brooklyn pediatrician made a diagnosis of Tay-Sachs disease (amaurotic family idiocy), yet Bernard Sachs of New York stated emphatically that there was no cherry red spot in the macular area and that without this a definite diagnosis could not be made. Other well known neurologists declared that the baby was suffering from external hydrocephalus. However, neither diagnosis could be confirmed because autopsy was refused. Regardless, now, of the diagnosis, the couple wanted the following questions answered: 1. Have both hydrocephalus and Tay-Sachs disease occurred in any case reported? 2. What are the chances of hydrocephalus appearing in subsequent children? (Syphilis has been excluded.) 3. Although Boyd ("Pathology of Internal Medicine") states that following one case of Tay-Sachs disease subsequent children seldom escape, Bernard Sachs ("Osler's Modern Medicine") states that he has seen "normal children grow up side by side with the victims of the disease." What do you think of the possibility of having normal children after there has been one case of Tay-Sachs disease? 4. In the case cited by the young couple, are you inclined to agree with me that the case was not Tay-Sachs disease because: (*a*) No cherry-red spot was seen. (*b*) The head became larger. (*c*) The baby was the first born? 5. What factors would the young couple have to consider, what obstacles to avoid and what care to take to prevent either Tay-Sachs disease or hydrocephalus? Please omit name. M.D., New York.

ANSWER.—1. A careful review of many reported cases fails to reveal the association of hydrocephalus with Tay-Sachs disease.

2. Since hydrocephalus depends for the most part on some congenital malformation or a prenatal inflammation, the chances for congenital transmission present a remote possibility, and as a matter of experience the occurrence is unlikely.

3. This question does not admit of a categorical reply. Experience has shown that when one child in the family has suffered from amaurotic family idiocy, a subsequent child may suffer similarly, though it is equally true that in certain families there have been a number of perfectly normal children and one or more suffering from amaurotic family idiocy.

4. A diagnosis of Tay-Sachs disease cannot be definitely made unless the cherry-red spot is present, with optic atrophy and progressive blindness associated with increasing mental deterioration and physical emaciation.

5. It is difficult to answer this question. Many mothers have borne a congenitally defective child and have been subsequently blessed with normal children.

JELLYFISH AND STINGING NETTLES

To the Editor:—Referring to the Query and Minor Note entitled "Bite of 'Jellyfish' or 'Stinging Nettle,'" which appeared in THE JOURNAL, April 9, I am writing to inform you that your information about jellyfish is wrong.

Webster's dictionary describes Portuguese man-of-war under "Physalia." That is one animal. The jellyfish is another animal which is entirely different.

The Portuguese man-of-war can be seen from a distance. It is like a floating bladder. If one is picked out of the water, tentacles of various kinds can be seen hanging down. The jellyfish, on the other hand, is indivisible and does not float above the surface. I have swum among jellyfish and could feel them but not see them.

Jellyfish seem to run in large numbers. The sizes vary. Sometimes they are small, weighing about 1 to 4 ounces and as transparent as if made of glass. The top seems to be like skin to the feel, while the bottom feels as if it really were some substance like jelly.

Some jellyfish run large and a beautiful ruby color. They look very much like placentas minus the cord, of course.

I have seen children playing with jellyfish but have never known of them to be "stung"; on the other hand, I have read of people being "stung" with jellyfish, and I would not be a bit surprised if the so-called stings were really sunburn. It is possible that persons who don't know enough not to get all burned red while bathing might think their trouble came from the jellyfish.

The Portuguese man-of-war seems to be scarce and I doubt whether it ever bothers bathers. The bladder appears to be from 6 to 8 inches long, and a person swimming could easily see and keep away from it. It is reasonable, too, that the Portuguese man-of-war, being slow and unable to leave the surface of the water, should carry some defense, while the jellyfish is defended by his low visibility, and he does not need a sting. Please omit name and city. M.D., New York.

ANSWER.—This question was referred to the Bureau of Fisheries, which replies:

"You state that the Portuguese man-of-war is closely related to the sergeant fishes. We presume that the statement is meant to convey the idea that there is a small fish whose habit is to remain close to the tentacles of Physalia and so protect itself from its enemies. The Portuguese man-of-war is a siphonophore which normally inhabits the tropical waters but which is not uncommon in the summer as far north on the Atlantic Coast as Woods Hole, Mass. Colloquially speaking, it is a jellyfish, a term applied to many of the soft bodied pelagic forms found in the ocean. Usually, however, jellyfish is the term applied to the disk or inverted saucer shaped medusae, the common inshore form of which is Aurelia. This form looks like a large opalescent button floating around the docks and shallow waters and is probably quite harmless. The offshore form, which reaches a much larger size and which is reddish, bearing long curtain-like tentacles, is Cyanea and is encountered in deep water in abundance. Contrary to the belief of your correspondent, Cyanea is a very annoying animal to handle and is always carefully avoided by fishermen when they encounter it. I have first hand knowledge of the injuries which Cyanea can inflict.

"The small jellyfish which your correspondent describes as occurring in great numbers seems to be a ctenophore, or comb jelly, as it is usually called. The common animals of this group are Mnemiopsis, or Beroe. These animals look like large gooseberries when seen floating in the water, and I am sure that it is they to which your correspondent refers when he describes his being able to feel but not see them, as they are almost transparent. He has, however, not mentioned the Medusa, which is known in Chesapeake Bay as the sea nettle and which is known to science as Dactylometra quinquecirrha. This whitish animal has long tentacles heavily armed with nematocysts, and, when struck by the body of a swimmer, it is capable of administering a shock not unlike that received from an induction coil. The mark left on the skin after such an encounter will often last for several weeks.

"Of all the forms mentioned only the last, together with Cyanea and Physalia, are dangerous, and of these three the latter is the greatest offender."

USE OF ALUMINUM CHLORIDE FOR HYPERHIDROSIS

To the Editor:—In prescribing aluminum chloride 25 per cent for hyperhidrosis can I add any other drug to increase its efficiency? Please give a good vehicle for prescribing the aluminum chloride 25 per cent in liquid and ointment or paste forms. Also please give a good perfume or volatile oil with the amounts which may be added to make the prescription pleasing for one when applying the treatment.

J. PRESTON DAVIS, M.D., Waterproof, Ind.

ANSWER.—It is doubtful whether the efficiency of aluminum chloride solution could be enhanced by the addition of any other drug, excepting possibly alcohol, which is also astringent as well as antiseptic. Hence the best vehicle for prescribing is diluted alcohol. The following prescription might give a sufficiently satisfactory and pleasing result:

℞	Oil of rose geranium	0.05 cc.
	Oil of lavender	0.05 cc.
	Oil of cloves	0.05 cc.
	Ethyl acetate	0.10 cc.
	Aluminum chloride	50.00 Gm.
	Alcohol	100.00 cc.
	Water, to make	200.00 cc.

M. Label: Apply locally. For external use only.

DELAYED PUBERTY IN GLANDULAR DYSTROPHY

To the Editor:—A boy, aged 14 years and 8 months, 6 feet (183 cm.) in height and weighing 214 pounds (97 Kg.), with small, rather undeveloped, testicles and a small penis, is not as amorously inclined as is usually the case in boys of his age. Please offer suggestions as to treatment for the testicular and penile condition and also as to weight reduction. Otherwise the boy seems to be normal. Please omit name.

M.D., North Carolina.

ANSWER.—The age at which a boy attains puberty varies within wide limits, and the fact that the boy mentioned is not "as amorous" as boys in general has really little significance and may well be due to the way he has been brought up.

However, the picture seems to indicate a subthyroid condition in which there is present the usual combination of obesity and underdeveloped genital organs. A metabolism test might aid in the diagnosis.

The patient should be given thyroid extract, about 0.013 Gm. (one-fifth grain) twice a day, as well as tablets of the anterior lobe of pituitary extract, starting with 0.3 Gm. (5 grains) twice a day and increasing until he takes 0.3 Gm. four times a day.

It is important that the boy lead an outdoor life, with plenty of exercise and a diet rich in proteins but deficient in fats and carbohydrates. The diet should vary and be altered from time to time, depending on his general condition and weight.

VITILIGO

To the Editor:—A girl, aged 13, began to menstruate at the age of 10. Menstruation was irregular for the better part of three years but is now regular every month. She is well developed, weighs 131 pounds (59 Kg.) and is 62 inches (157.5 cm.) in height. She first noticed a leukodermal spot on one of her fingers twelve months ago. This has extended to the dorsal surface of all the fingers on both hands. About one month ago her right upper eyelid lashes began to turn white. Do you think this is a beginning vitiligo? Has any real treatment been recommended? Please omit name.

M.D., Georgia.

ANSWER.—There is little doubt that the case is one of vitiligo. The treatment is disappointing. As long as the disease is spreading, the only treatment likely to give results is that advocated by H. C. L. Lindsay (Treatment of Leukoderma with Gold Sodium Thiosulphate, *Arch Dermat. & Syph.* **20**:22 [July] 1929). This has its dangers and often fails. Long continued, repeated reactions produced by ultraviolet rays clear up the spots in some cases but it is a slow process. A paint composed of liniment of soft soap, alcohol and burnt umber can be applied to protect the surrounding pigmented skin from further browning during this treatment.

INDUCTION OF LABOR

To the Editor:—What are the most common methods used for the induction of labor? Is castor oil and solution of pituitary a fairly safe combination to use for induction of labor? Kindly omit name.

M.D., South Dakota.

ANSWER.—Castor oil and quinine were introduced by Gill Wylie early in the seventies for the induction of labor, and the method has been proved to be reasonably safe. Large doses of quinine are believed by some to kill the baby and there are some cases on record in which the uterus ruptured as the result of too strong pains induced by this drug. From 0.2 to 0.3 Gm. (3 to 5 grains), repeated not more than once, should be the limit. Solution of pituitary was later added to the combination and, if given in fractional doses and carefully watched, it may safely be used to supplement the action of quinine and castor oil. Three hours after the last dose of quinine, fractional doses of pituitary are administered hypodermically, beginning with one-half Voegtlin unit (there are 10 units in each ampule), repeating this every twenty to thirty minutes and, after one hour, doubling the dose. Not more than 10 units should be given in one day. Larger doses of pituitary are risky. Some physicians apply the drug intranasally, removing the pack at the first evidence of tumultuous uterine action.

PERSISTENT GONOCOCCIC INFECTION

To the Editor:—I have a patient, aged 37, with a chronic gonococcic infection of the prostate gland who has had all kinds of treatment, including irrigation, vaccines, massage, sound and diathermy, and yet remains positive for gonococci. Is there any other kind of treatment one may use that would be beneficial? Please omit name.

M.D., Indiana.

ANSWER.—Since the doctor has evidently exhausted all the common methods employed in his effort to eradicate the gonococcus from his patient, he might try experimentally the Gonococcal Bouillon Filtrate, obtainable from the Experimental Department of Parke, Davis & Co., with directions how to use it.

Prostatic massage is still indicated at about five day intervals. Of course, it is understood that this patient still has gram-negative diplococci as demonstrated by proper technic, otherwise the filtrate will be of no value.

DERMATITIS FROM METAL POLISH

To the Editor:—A patient consulted me suffering from a dermatitis of the hands and forearms and such constitutional symptoms as headache, malaise and nausea, without any fever. He had been working with a metal polish and attributed his symptoms to the polish. The polish has the following formula, which was obtained from the manufacturer:

Water	643½ pounds
Oxalic acid	1½ pounds
Alcohol	4 pounds
Foam silica	200 pounds
FFxx silica	200 pounds
VMP (benzine)	14 pounds
Ammonia	32 pounds
Oleic acid	74 pounds
Sassafras	2 pounds
Lemonone (artificial citronella)	6 pounds

Please tell me whether there is any ingredient that might be responsible for this patient's difficulty. Please omit name.

M.D., New York.

ANSWER.—Metal polishes long have been recognized as sources of dermatoses. Several of the constituents listed in the formula are known skin irritants. This may be due to chemical action (such as that from oxalic acid) or from mechanical action (such as that from silica). Rather than regarding a single constituent as the probable offender, it is more reasonable to assume that mixed irritation may have taken place.

Evaporation of the water content from rags used in polishing tends to leave in concentrated form such ingredients as the oxalic acid. Frequently a precise diagnosis may be made by cutting off a small portion of the rags used in polishing and affixing to the skin as a patch test, as discussed in THE JOURNAL, April 16, page 1367.

From the formula cited, it is unlikely that constitutional symptoms will directly arise. If such constitutional manifestations are associated with the metal polish, they are probably consequent to the dermatitis.

FRÖHLICH SYNDROME

To the Editor:—Given a case of a boy, aged 12 years, 60¼ inches (183 cm.) tall and weighing 150 pounds (68 Kg.), with the genitals markedly underdeveloped, what would you consider the best method of treatment? Glandular therapy has produced no change in about six months. Pituitary and thyroid have been used over that period, as well as limitation of starches and sugar and increased exercise.

DANIEL B. LYNCH, M.D., Albany, N. Y.

ANSWER.—Patients of the type referred to are difficult to appraise accurately and are equally difficult to treat. All will agree that this Fröhlich type is due to a disturbance in hypophyseal function. The nature of the degenerative changes occurring in this gland is not easy to determine. The gland substance may deteriorate on account of pressure from a hydrocephalus or from a tumor in the gland substance.

In any case, a careful neurologic and ophthalmologic examination should be made and repeated sugar tolerance tests should be taken to determine, if possible, whether the condition is due to an organic lesion or whether there is dysfunction of the gland, especially in relation to sugar tolerance. If the condition is due to simple hypoplasia as opposed to some destruc-

tive lesion caused by tumor or pressure from without, one might expect some improvement by administering whole pituitary gland substance; from 0.6 to 1.16 Gm. (9 to 18 grains) of this preparation has been given daily.

Enlightening information on the nature and treatment of these disorders may be found in the monograph of Dr. Harvey Cushing on "The Pituitary Body and Its Disorders" (Philadelphia, J. B. Lippincott Company, p. 175, case 34, and pages 257 to 259 on adiposity).

JUGULAR FORAMEN SYNDROME

To the Editor:—Will you be good enough to define the jugular foramen syndrome and its significance.

E. R. FERGUSON, M.D., Cleveland, Tenn.

ANSWER.—The jugular foramen syndrome is applied to certain symptoms arising from injury to the ninth, tenth and eleventh cranial nerves, which pass out through the jugular foramen. Injuries such as fracture of the skull and wounds of various kinds in the region of the foramen may produce the symptoms. A knowledge of the function of the glossopharyngeus, the vagus and the spinal accessory nerves, and the signs and symptoms appearing as a result of lesions in or about the jugular foramen, will explain the signs and symptoms that usually appear, such as paralysis of the superior constrictor muscle of the pharynx on the same side producing some difficulty in swallowing, paralysis of the soft palate, loss of sense of taste in the posterior third of the tongue, paralysis of the tongue, and anesthesia of the larynx together with paralysis of the sternocleidomastoid muscle.

DISGUISING TASTE OF COCAINE

To the Editor:—Is there any way of camouflaging the taste of cocaine in order to make topical applications of the solution less distasteful when applied to the pharynx? Please omit name. M.D., Wisconsin.

ANSWER.—It is difficult to camouflage or cover the bitter taste of cocaine. The alkaloid itself (not the chloride or other salts) can be dissolved in oil, to which oil of rose may be added, and it is thus possible to disguise the taste somewhat.

HUMIDITY IN THE SOUTHWEST

To the Editor:—I called the attention of the United States Weather Bureau here in Phoenix to the items appearing in Queries and Minor Notes, January 9 and April 2. The one on the latter date refuted the accuracy of relative humidity readings as taken in Phoenix and Tucson. It was written by the manager of the Tucson Sunshine Club. Mr. R. Q. Grant, meteorologist of the Weather Bureau in Phoenix, Arizona, writes:

"Please be advised relative to relative humidity of Tucson as compared with that of Phoenix that the advertisement of such data has been continued for a long time and has given the wrong impression to the public, particularly the suggestion that relative humidities were caused to appear considerably lower at Tucson than at Phoenix because made two hours later in the morning and one hour earlier in the evening.

"During the years 1930 and 1931, relative humidity readings have been made at noon at both places, thus affording a proper basis of comparison. At Phoenix, average noon readings for the year 1930 were 26 per cent; at Tucson, 31 per cent. At Phoenix for the year 1931, average noon readings were 28 per cent; at Tucson for the year, 34 per cent.

"An indication of greater relative humidity at Tucson than at Phoenix appears in the number of days with rain: At Phoenix in 1930 there were 43 days in which rainfall equaled one one-hundredth inch; at Tucson, 47 days. In 1931 at Phoenix there were 38 days with one one-hundredth inch or more rainfall; at Tucson, 72 days. In connection with this phase of the subject, Tucson has 50 per cent more rainfall than Phoenix.

"In the year 1930, Phoenix had 8.04 inches of rainfall; Tucson, 12.27 inches. In 1931, Phoenix had 10.32 inches of rainfall; Tucson, 16.26 inches. Let us cite an example to show what rainfall does to relative humidity: Seattle, Washington, with an annual rainfall of 34 inches, has an average relative humidity of 77 per cent; Spokane, in the same state, with an annual rainfall of nearly 17 inches, has a relative humidity of 63.5 per cent.

"As to one-half million acres undergoing irrigation in this valley it is well to remember that but a small area comparatively is under water at the same time, vegetation will stand only a limited amount of water, and our reservoirs, filled as they are, could not endure constant demand, as one might infer from the enclosed clipping. Besides, and finally, experiment has shown time and again that an area entirely covered with water will give off to the atmosphere less moisture than an equal area covered with prairie grass, the latter possessing numberless mouths through which moisture is transpired. So let us forget about irrigation and remember the rainfall.

"Since June, 1916, the equipment for obtaining relative humidity at Phoenix has been on the lawn of the Postoffice Building and has never been on a building exceeding three stories."

LESLIE R. KOBER, M.D., Phoenix, Ariz.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Montreal, Sept. 19. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Montreal, Sept. 17. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

CONNECTICUT: *Endorsement.* July 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

Illinois January Report

Mr. Paul B. Johnson, superintendent of registration, Illinois Department of Registration and Education, reports the written and practical examination held in Chicago, Jan. 12-14, 1932. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Forty-one candidates were examined, 32 of whom passed and 9 failed. Sixteen physicians were licensed by reciprocity with other states and 2 physicians were licensed by endorsement. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent
Loyola University School of Medicine	(1930) 83, (1931)	81
Northwestern University Medical School	(1931) 80, 82, 85, 85, (1932) 81	
Rush Medical College	(1930) 77, (1931) 78, 83, 84, 85, 85, 86, 88	
University of Illinois College of Medicine	(1931) (1932) 79, 81, 83, 84, 84, 86, 87, *	84,
Tufts College Medical School	(1928) 83, (1929)	79
University of Minnesota Medical School	(1931)	76, 84
University of Pennsylvania School of Medicine	(1929)	84
Dalhousie University Faculty of Medicine	(1929)	83
McGill University Faculty of Medicine	(1922)	77
University of Bordeaux Faculty of Med. and Pharm.	(1914)	75

FAILED		
College	Year Grad.	Per Cent
Chicago Medical School	(1931) 72, 80,† (1932)	65
Rush Medical College	(1931) 67, 77,†	79 †
McGill University Faculty of Medicine	(1926)	62
University of Naples Faculty of Medicine and Surgery	(1925) (1930) 65 ‡	71,‡

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
Howard University College of Medicine	(1930)	Georgia
Northwestern University Medical School	(1927)	Missouri
Rush Medical College	(1930)	Michigan
State University of Iowa College of Med.	(1916), (1928, 2)	Iowa
Harvard University Medical School	(1929)	Penna.
St. Louis University School of Medicine	(1929)	Missouri
Washington University School of Medicine	(1927), (1930)	Missouri
Jefferson Medical College of Philadelphia	(1920) §	Iowa
University of Pittsburgh School of Medicine	(1924) §	Penna.
Meharry Medical College	(1927)	Missouri
University of Sidney Medical School	(1922)	Minnesota
University of Berlin Faculty of Medicine	(1929)	Michigan
University of Freiburg Faculty of Medicine	(1926)	Ohio

LICENSED BY ENDORSEMENT		
College	Year Grad.	Endorsement of
Rush Medical College	(1926), (1927)	N. B. M. Ex.

* No grade given.
† Failed in clinical work.
‡ Verification of graduation in process.
§ License withheld pending payment of fee.

Nevada May Report

Dr. Edward E. Hamer, secretary, Nevada State Board of Medical Examiners, reports the written examination held in Carson City, May 2-4, 1932. The examination covered 11 subjects and included 79 questions. An average of 75 per cent was required to pass. Four candidates were examined, 3 of whom passed and 1 failed. Three physicians were licensed by reciprocity with other states. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent
Northwestern University Medical School	(1932)	84.6*
Cornell University Medical College	(1931)	87.3
Queen's University Faculty of Medicine, Ireland	(1920)	83

FAILED		
College	Year Grad.	Per Cent
Maryland Medical College	(1906)	59.4

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
College of Medical Evangelists	(1930)	California
Baltimore Medical College	(1913)	New York
Washington University School of Medicine	(1927)	Missouri

* This applicant has received an M.B. degree and will receive an M.D. degree on completion of an internship. License will be issued when diploma is granted.

Kentucky Reciprocity Report

Dr. A. T. McCormack, secretary, Kentucky State Board of Health, reports 10 physicians licensed by reciprocity with other states from Jan. 13 to June 24, 1932. The following colleges were represented:

LICENSED BY RECIPROCITY			
College	Year Grad.	Reciprocity with	
Rush Medical College	(1926)	Ohio,	(1929) Illinois
Tulane University of Louisiana School of Medicine	(1925)	Alabama	
University of Michigan Medical School	(1929)	Michigan	
Hahnemann Med. College and Hosp. of Philadelphia	(1929)	Penna.	
University of Pennsylvania School of Medicine	(1929)	Penna.	
Meharry Medical College	(1930),	(1931)	Tennessee
Medical College of Virginia	(1923)	West Virginia,	(1926) Maryland

Oregon Reciprocity Report

Dr. C. J. McCusker, secretary, Oregon Board of Medical Examiners, reports 4 physicians licensed by reciprocity with other states from March 24 to May 31, 1932. The following colleges were represented:

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
Harvard University Medical School	(1923)	Mass.
University of Minnesota Medical School	(1925)	Minnesota
University of Oregon Medical School	(1928)	California
Medical College of the State of South Carolina	(1922)	S. Carolina

Book Notices

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1931 with Comments That Have Appeared in The Journal. Cloth. Price, $1. Pp. 100. Chicago: American Medical Association, 1932.

This book is a record of the consideration by the Council on Pharmacy and Chemistry of products found unacceptable for inclusion in New and Nonofficial Remedies. It is also the repository of valuable preliminary reports on the status and standardization of drugs that are not yet ready for general use by the medical profession and of timely special reports on the use or limitations of drugs that have already been recognized. The current volume of Council Reports is chiefly notable for reports of the last named category. In a report on the optimal dosage of cod liver oil, the Council puts on record the dosage arrived at as a result of a questionnaire sent to leading pediatricians; in another report on the intravenous use of barbital compounds is given the Council's considered verdict on the dangers of and the very limited indications for the use of the barbitals intravenously.

Among the reports on products found unacceptable are those on Thymophysin, a preparation of posterior pituitary and thymus, advocated as a safe and reliable means of accelerating delivery and marketed under false claims as to its essential action, as to its strength, and as to its safety for mother and child; on Bismuthoidal, claimed to be colloidal bismuth and marketed with unwarranted claims of value in the treatment of syphilis intravenously; on Frenly Enema Cream, a complex, unscientific mixture marketed under a therapeutically suggestive name, which is noninforming as to the composition, and with unwarranted claims of therapeutic value; on Olagen, a needlessly complex and unscientific mixture, of inadequate dosage, marketed under a nondescriptive name with unwarranted claims of therapeutic value in a host of conditions; on Hayner's Normaline, an unoriginal preparation of formaldehyde and zinc chloride marketed under a noninforming name, without a quantitative statement of composition on the label or in the advertising, and with unwarranted and misleading claims; on Pernocton, a barbituric acid product marketed under a therapeutically suggestive name and with unacceptable recommendations for intravenous use; on Solution Normet, an unscientific mixture of citrates marketed with unwarranted claims; and on Alqua Water, Calso Water and Alka Water, irrational proprietary "alkalizing" mixtures marketed with unwarranted and misleading claims.

The preliminary reports include those on Nucleotide K 96, a preparation of pentose nucleotides which has shown promise in the treatment of leukopenia; and on Carbarsone, which is *p*-carbamino-arsonic acid and which needs further confirmatory evidence for its value in the treatment of amebiasis, for which it is proposed.

Geburtshelfer und Röntgenbild: Erweiterung und Erneuerung der Geburtshilfe durch die Röntgendiagnostik. Von Universitätsprofessor Dr. Wilhelm Liepmann, Direktor des Deutschen Instituts für Frauenkunde und der Frauenklinik „Cecilienhaus," Berlin, und Dr. Gerhard Danelius, Assistenzarzt am Strahleninstitut des „Cecilienhaus." Paper. Price, 25 marks. Pp. 271, with 160 illustrations. Vienna: Urban & Schwarzenberg, 1932.

This unique monograph is dedicated by Liepmann and Danelius to Prof. Hugo Sellheim on the occasion of his sixtieth birthday. Besides being an atlas of obstetric radiography, it contains a series of fetal reconstructions in various presentations and positions, which have been artistically and accurately drawn from tracings from the films. A print of each original film used in illustration is shown and on the page opposite is the reconstruction, with full explanatory captions in German, English and French. The roentgenograms are reproduced with unusual clarity. While mention is made in the text of the diagnosis of early pregnancy by utilizing pneumoperitoneum and combined uterosalpingography and pneumoperitoneum, the authors evidently have had no personal experience with this valuable diagnostic technic and therefore have devoted their efforts mainly to a study of the later period of pregnancy. Frequent reference is made by the author to the epoch-making work of Warnekros in this field, and as is usual with German authors, few American references are cited, although a great many valuable contributions have been published in this country. Experiments were made by the authors on the relation of the position of the fetus to activity of the mother. For this purpose, pregnant women were whirled about on swivel chairs, films being taken before and after, with interesting and instructive results. Roentgen pelvimetry is described, and fetal monstrosities and multiple pregnancy are discussed; in the latter, however, only twins are illustrated. Finally, the third stage of labor is illustrated by roentgenography of the injected placenta, a contrast medium as first described by Weibel being used. The book will be acclaimed by teachers and students of obstetrics. It is printed on heavy glazed paper, well suited to roentgen illustration, in bold type, easily readable and free from errors. An adequate index is appended.

Pioneer Medicine in the Western Reserve. Compiled by Howard Dittrick, M.D. Boards. Pp. 110, with illustrations. Cleveland: Academy of Medicine of Cleveland, 1932.

This little book contains sketches and artistic portraits of fourteen physicians who have been influential factors in the medical life of Cleveland. Eight of these men have been deemed worthy of a place in Kelly and Burrage's Dictionary of American Medical Biography. The dedication is "To the Pioneer Mothers of the Western Reserve." The sketches are by various authors and appeared originally in the bulletin of the academy. In these sketches there is depicted the life and practice of medicine by pioneer physicians, the beginning of medical education and schools, the organization of medical societies, the founding of medical libraries, and the initiation of public health measures. In a general way the men of this group remind one of similar groups who stand out in the early days of many cities of the Middle West. Such a compilation as this impresses one with the debt we owe our pioneer ancestors in medicine who accomplished so much under adverse conditions. Future generations of Cleveland doctors will be grateful to those who prepared these sketches and compiled them in such an attractive manner.

Health and Its Maintenance: A Hygiene Text for Women. By Bertha Stuart Dyment, M.D., Medical Adviser of Women and Director of Physical Education for Women, Stanford University. With a chapter by Catharine Cox Miles, Ph.D., and one by Mrs. Eric Allen. Cloth. Price, $3.50. Pp. 472, with 62 illustrations. Stanford University: Stanford University Press; London: Oxford University Press, 1931.

Dr. Dyment has had a large experience in the teaching of hygiene to young women, in addition to an excellent scientific training. The present volume doubtless grows out of this classroom experience, a source which explains its practical character. In form it reverts to that of a number of the earlier works on personal hygiene, enough anatomy and physiology of the body and its parts to enable the student to read more understandingly the hygiene that follows. The latter follows custom in dealing with different systems, muscular, circulatory, and so on. In content the book is practical, concise and clear, and the information given is accurate and dependable.

There is an excellent chapter on individual mental hygiene from the point of view of the girl and the young woman which evidences practical knowledge of their problems and difficulties. As might be expected, the care of the skin receives considerable space and is well handled, but the reader is surprised that headaches are given only the briefest comment. The treatment of sex hygiene and reproduction is adapted to a work for women by the omission of material of particular interest to boys rather than the inclusion of an unusual amount of material for girls. The subject is handed sanely and well, however. On the whole, the book is a good one for the use of girls in high school or college; but why not have added a small amount of material in two or three chapters and omitted the qualifying phrase "A Hygiene Text for Women"? It would then be just as good a textbook for women and a perfectly good one for men. The printing is hygienic and the indexing unusually good.

Growth in Private School Children with Averages and Variabilities Based on 3,110 Measurings on Boys, and 1,473 on Girls, from the Ages of One to Nineteen Years. By Horace Gray, Stanford University Hospital, San Francisco, and J. G. Ayres, The Institute for Juvenile Research and Behavior, Research Fund, Chicago. Cloth. Price, $3.50. Pp. 282. Chicago: University of Chicago Press, 1931.

The object of the study reported in this book was to estimate the physical constitution of private school children, children whose parents were marked by professional or economic success. The general trend of growth is charted and expressed in formulas. There are also comparisons between these children and those reported by others. Differences in racial stocks are studied. Unfortunately, most readers of such a report will be lost in the maze of statistics. The value of the report might well have been enhanced by a general conclusion as to the results of the study.

Pathologische Physiologie der Wirbelsäule: Angeborene, konstitutionelle und funktionelle Veränderungen. Von Prof. Dr. Walther Müller, Oberarzt der Chirurgischen Klinik Königsberg i. Pr. Paper. Price, 35 marks. Pp. 319, with 274 illustrations. Leipzig: Johann Ambrosius Barth, 1932.

This book, on the pathologic physiology of the vertebra, was written by a man of excellent qualifications, as proved by his previous book on diseases of the bones. The book includes descriptions and illustrations of congenital, constitutional and functional disturbances of the vertebrae. A noteworthy feature is the emphasis placed on the embryologic aspects of each of the subjects discussed. There is an interesting roentgenogram of a case of arthritis deformans of the costotransverse joint. Of especial interest are chapters on embryology of the spine, homologues of the ribs, the different types of lumbar ribs, cuneiform or wedged-shaped vertebrae, congenital scoliosis, Klippel-Feil syndrome, disturbances of the nucleus pulposus, angioma of the thoracic vertebrae, chondrodystrophia foetalis, generalized thickening of the vertebral bodies, isolated thickening of individual vertebral bodies, malacia of the vertebrae including osteitis fibrosa and osteomalacia, acromegaly with thoracic kyphosis, dystrophia adiposogenitalis, hypertrophic arthritis, spondylolisthesis and posture. The illustrations, which include roentgenograms of living and of dead specimens, line drawings, diagrams and photographs, were well selected and reproduced. The publisher's work is excellent. The reproduction of the illustrations of the epiphyses of the vertebrae and pelvis is especially good.

Vegetable Fats and Oils: The Chemistry, Production and Utilization of Vegetable Fats and Oils for Edible, Medicinal and Technical Purposes. By George S. Jamieson, Ph.D., Chemist in Charge of Oil, Fat, and Wax Laboratory, Bureau of Chemistry and Soils, United States Department of Agriculture. American Chemical Society, Monograph Series. Cloth. Price, $6.50. Pp. 444. New York: Chemical Catalog Company, Inc., 1932.

This monograph brings within the compass of one volume the important information on source, extraction, manufacture, refining, hydrogenation, physical and chemical characteristics, composition, uses and general nutritive value of vegetable fats and oils. References for more detailed information are provided under the subjects treated. The fats and oils are arbitrarily divided into three classes, the nondrying, semidrying and drying, in accordance with the range of their iodine numbers. A chapter is devoted to fatty acids, alcohols, sterols, hydrocarbons and phosphatides, and another to recognized methods for the examination and analysis of fats and oils. The appendix includes tables of useful data, some characteristics of fats and oils, and their botanic and common names. The entire subject is treated in an unusually practical and simple manner. The treatise makes a vast amount of valuable information on fats and oils conveniently available, is fundamentally a descriptive reference work, and will be welcomed by all seeking information on this subject.

Das retikulo-endotheliale System der Schizophrenen: Experimentell-klinische Untersuchungen zum Schizophrenieproblem. Von Dr. Fr. Meyer, Oberarzt an der Landesheilanstalt Neuhaldensleben. Sonderausgabe von Heft 62 der „Abhandlungen aus der Neurologie, Psychiatrie, Psychologie und ihren Grenzgebieten." Paper. Price, 12 marks. Pp. 124, with 11 illustrations. Berlin: S. Karger, 1931.

The author begins with the assumption that schizophrenia is an organic disease and that some pathologic changes exist as a basis for it. In his research he utilized the functional tests of the reticulo-endothelial system, as he felt that the vascular system is the key to the understanding of schizophrenia. The author used the congo red method, which consisted in injections of a solution of congo red intravenously and the subsequent colorimetric estimation of the dye in the blood. The other method used is that known in the German literature as the Kauffmann method, which consists in the study of the exudate after application of the cantharides plaster to the skin (Kauffmann, F.: Die ortlich entzündliche Reaktionsform als Ausdruck allergischer Zustande, Krankheitsforschung, vols. 2 and 3, 1926). The author studied sixty cases of schizophrenia, twenty cases of organic brain disease, which consisted of dementia paralytica and epilepsy with mental deficiency, four cases of encephalitis, and six cases of manic depressive psychoses. He comes to the conclusion that there is a definite disturbance of the reticulo-endothelial system in schizophrenia such as one finds in mild intoxications of the organism. Cases of dementia paralytica show a similar disturbance. The results in manic depressive psychosis are inconclusive. The research is undoubtedly a valuable piece of work but the author's conclusions would have been more convincing had he given his results in a control group of cases.

The Life of Edward Jenner, M.D., F.R.S., Naturalist, and Discoverer of Vaccination. By F. Dawtrey Drewitt, M.A., M.D., F.R.C.P. Cloth. Price, $2; 6/-. Pp. 127, with portrait. New York & London: Longmans, Green & Company, 1931.

This book is planned for those who are neither doctors nor naturalists. It is, in other words, a popular life of the famous discoverer of vaccination. Few people realize that Jenner was an accomplished musician, a good amateur poet, a fairly good surgeon and an exceedingly proficient naturalist. Many of his essays on birds and animals have a classic quality. The little volume by Dr. Drewitt will be read by many persons who will not care to read the more extensive study in two volumes that was published long ago.

Die Krankheitsanfänge bei chronischen Leiden. 17 Vorträge gehalten zu Heidelberg vom 1.-3. August 1931 in der gemeinnützigen öffentlichen Krankenanstalt Sanatorium Speyererhof. Herausgegeben von Prof. Dr. A. Fraenkel. Boards. Price, 4 marks. Pp. 175, with 15 illustrations. Leipzig: Georg Thieme, 1932.

The early manifestations of disease, in contrast to the usual description, which is based on the fully developed clinical picture, forms the basis of the seventeen lectures constituting the material of this volume. These lectures were delivered at the Sanatorium Spyerershof in Heidelberg and were designed for the general practitioner in order to familiarize him with those stages of disease which are most amenable to treatment. Considerable emphasis is placed on periodic medical examination, aided by roentgenologic studies when necessary and supplemented by the "follow up" system as practiced in the United States. The subsequent lectures treat of renal disease, cardiac failure, diabetes, certain disturbances of the central nervous system, liver disorders, thyrotoxicosis and pulmonary tuberculosis. Each lecture contains several interesting features, most of which are of practical significance. For example, general fatigue and other vague manifestations, which cannot definitely be explained on the basis of myocardial failure, can be satisfactorily explained as due to cardiac weakness if there is rapid and definite relief after an intravenous injection of strophanthin. There is a definite need for a practical work of this sort, and this book will prove of value to the general practitioner who wishes to remain familiar with the more

recent developments in the field of medicine, particularly as expressed by the views held by those who have contributed to this volume.

Medical Aspects of Old Age: Being a Revised and Enlarged Edition of the Linacre Lecture, 1922. By Sir Humphry Rolleston, Bart., G.C.V.O., K.C.B., M.D., Regius Professor of Physic in the University of Cambridge. Second edition. Cloth. Price, 7/6. Pp. 205, with 7 portraits. London and New York: Macmillan & Company, 1932.

The distinguished professor of physic in the University of Cambridge has assembled in a new form the data that constitute the basis of his lecture on medical aspects of old age, delivered in 1922 at Cambridge. Originally published in a brief volume, the lecture has now been expanded into a work of considerable proportions. There are ten chapters which consider the duration of life and causes of old age, the normal structural changes that occur, the factors that influence longevity, and diseases peculiar to old age, with special emphasis on cancer. Dr. Rolleston has availed himself particularly of the researches of Raymond Pearl and of Warthin's notable contribution to the subject. The literary qualities of any of Dr. Rolleston's articles are such as should commend them to the general reader; his reputation as a physician insures their accuracy. His book is thought provoking and will be read with interest not only by physicians but by many educated laymen.

A Method of Increasing the Sensitiveness of the Wassermann Test. By E. J. Wyler, M.C., M.D. Reports on Public Health and Medical Subjects, No. 67. Ministry of Health. Paper. Price, 4d. Pp. 15. London: His Majesty's Stationery Office, 1932.

Wyler, in this pamphlet, presents a method for raising the sensitiveness of the Wassermann method number 1, Medical Research Council, an improved technic of which he described in 1929, by increasing the quantity of serum used in the test. This method was included in the League of Nations' serologic conferences of Copenhagen (1928) and of Montevideo (1930) and was considerably less sensitive than the Kahn test; hence, presumably, the attempt to increase its sensitiveness.

The Dictionary Companion. By C. O. Sylvester Mawson, Littt.D., Ph.D. Cloth. Price, $3.50. Pp. 479. Garden City: Doubleday, Doran & Company, Inc., 1932.

This volume is planned primarily to help spellers, but it serves a most useful purpose in aiding the enlargement of a vocabulary and in pronunciation. There are several chapters dealing with pronunciation and spelling, several chapters indicating the origins of unusual words and other useful lists. Every one interested in words as such and in the improvement of their use will find this book an aid to the task. The author is the editor of the well known Roget Thesaurus and Dictionary.

Données actuelles sur l'hormone testiculaire (modes d'obtention et de caractérisation). Par L. Cuny, chef de travaux au laboratoire de physiologie pathologique de l'École des Hautes Études (Collège de France), et D. Quivy, assistante au laboratoire de physiologie pathologique de l'École des Hautes Études (Collège de France). Préface de L. Hallion. Paper. Price, 16 francs. Pp. 76. Paris: Masson & Cie, 1932.

This book gives an excellent account of work done in the search for the actual internal secretion of the testicle. The work is complete and the authors have listed the various experiments in chronological order. There is discussion of the physiologic effect of extracts made by numerous methods and evaluated on various types of animals.

Health Protection for the Preschool Child: A National Survey of the Use of Preventive Medical and Dental Service for Children Under Six. Report to the Section on Medical Service. George Truman Palmer, Dr. P.H., Chairman, Subcommittee on Statistics; Mahew Derryberry, Research Assistant; Philip Van Ingen, M.D., Chairman, Committee on Medical Care for Children. White House Conference on Child Health and Protection. Cloth. Price, $2.50. Pp. 275. New York: Century Company, 1931.

This is another of the reports emanating from the White House Conference on Child Health and Protection. The report is divided into four parts. The first deals with the general status of preventive measures for children over the country. The second part gives the results of the survey of the use of preventive medical and dental service for preschool children in 156 cities and in the rural areas of forty-two states. The third part contains detailed statistical tables, while the fourth part presents administrative features of the survey. The chief value of this work is that it provides a comprehensive picture of the use of preventive measures among preschool children throughout the United States, and indicates the direction in which preventive medicine must direct its efforts in order to produce the maximum of good health among preschool children. Of course, a great variation in the application of preventive medicine is found in the different cities throughout the country. Health examinations seem to be more common in cities than in the rural districts, while in only six states do dental health examinations exceed the rural area. Cities are definitely superior in vaccinations, while diphtheria immunizations show an equal distribution in cities and in rural territory. Those interested in the application of preventive measures for preschool children will find this report well worth studying.

Chirurgie de la tête et du cou. Par Ch. Lenormant et Pierre Brocq. Seventh edition. Cloth. Price, 40 francs. Pp. 381, with 320 illustrations. Paris: Masson & Cie, 1931.

This is a small book containing the technic of operations on the head and neck. There are many illustrations, which are not as successful as they might be in suggesting the actual steps of the operation. One reads that the operations described are those which the authors' experience as prosectors and surgical practice have agreed on as the procedure of choice. This disregard for operative procedures in the surgery of the brain originated and transmitted to continental Europe by Americans is astonishing. The technic of any given operation cannot be taught by reading a textbook description, and to present a monograph with such an idea as a basis is fundamentally wrong.

Medicolegal

Sufficiency of Complaint in Revocation Proceedings

(Anderson v. Board of Medical Examiners (Calif.), 3 P. (2d) 344)

A sworn complaint was filed with the state board of medical examiners of California, charging the defendant-physician with unprofessional conduct in that she aided and abetted a named unlicensed person to practice a system and mode of treating the sick and afflicted. After notice and hearing, the board found the charges proved and revoked her license to practice medicine. She sought to annul the action of the board by successive appeals to the superior court, city and county of San Francisco, and to the district court of appeal, first district, division 1, California. The complaint on which she was tried by the board, the defendant contended, was legally insufficient because it failed to set forth the specific acts relied on as constituting aiding and abetting.

In California, said the district court of appeal, if the language of the statute on which an accusation filed with the board of medical examiners is based is sufficiently explicit to advise the person charged of the particular kind of unprofessional conduct of which he is accused, an accusation following that language is legally sufficient to confer jurisdiction on the board to hear and determine the matter. Section 14 of the medical practice act (Stats. 1927, p. 99) authorizes the board to revoke certificates to practice for "unprofessional conduct." Various acts are named which are deemed to constitute "unprofessional conduct," among which is ". . . aiding or abetting any unlicensed person to practice any system or mode of treating the sick or afflicted." The accusation filed with the board follows the language of the statute and is sufficiently explicit to inform the person charged with the particular kind of unprofessional conduct of which he is accused. The words "aid" and "abet" are commonplace words, the meaning of which is well understood. Their legal definition is no different from their meaning in common parlance. The word "aid" means to assist, to supplement the efforts of another. "Abet" includes the elements of knowledge of the wrongful purpose of the perpetrator and counsel and encouragement of the illegal act.

The plaintiff relied apparently on *Dyment* v. *Board of Medical Examiners*, 57 Calif. App. 260, 207 P. 409, in which the

accused was charged with having "procured by fraud and misrepresentation a certificate to practice medicine." The accusation in that case was held to be legally insufficient because the accusation did not set forth any of the facts relied on as constituting fraud and misrepresentation. But the word "fraud," said the district court of appeal, unlike the words "aid" and "abet," has no fixed, definite meaning. It is an inference of law to be drawn from facts and circumstances alleged and proved. It can and does assume so many shapes that courts and authors have been cautious in attempting to define it. Each case in which fraud is claimed to be involved must be considered under its own facts. An allegation of fraud in general terms presents no issuable fact. The facts constituting the fraud must be pleaded with particularity. No such difficulty, however, presents itself in accusing one of the aiding and abetting a named unlicensed person to practice.

For the reasons stated, the order of the board revoking the physician's license to practice was affirmed.

Malpractice: Homeopathic Physician as Expert Witness Concerning Nonsectarian Surgical Standards.—The defendant, an "allopathic" physician, was sued for damages for malpractice in removing a cyst. Over the defendant's objection, a homeopathic physician was permitted to testify as to the defendant's care and skill. A witness, said the Supreme Court of California, on appeal, may testify as an expert if he discloses knowledge of the subject sufficient to entitle his opinion to go to the jury. No rule of law prevails in California precluding a physician trained in one school of medicine from testifying as to the treatment rendered by a physician trained in a different school. Such a rule might be promulgated if the charge of malpractice was based on some special course of treatment to be tested by the general doctrine of a particular school. Such a rule is not applicable, however, to a case in which the alleged malpractice is based on general charges of negligence with respect to matters of almost common observation within the experience of every physician. All schools of medicine require their adherents to exercise care in surgical work to insure cleanliness, proper sterilization of instruments, treatment of wounds after operation, and precautionary measures to prevent infection. In the opinion of the Supreme Court, the homeopathic witness in this case was fully qualified to testify as to the propriety of every act of negligence alleged to have been committed by the defendant.—*Hutter v. Hommel (Calif.), 3 P. (2d) 554.*

Liability of Physician for Hot Water Bottle Burn.—An unconscious patient was burned by hot water bottles placed in the patient's bed by a special nurse. If, said the Supreme Court of Idaho, the physician was present when the hot water bottles were put into position by the nurse, he was in complete charge and under a duty to see that the nurse placed them in such a way as not to burn the patient. Even if the nurse should be deemed an independent contractor, she was under the circumstances under the physician's actual supervision and was for the moment his employee, and he was liable for her negligence resulting in injury to the unconscious patient.—*Davis v. Potter (Idaho), 2 P. (2d) 318.*

Evidence: Privileged Communications Between Patient and Examining Physician.—Information obtained by a physician who examines a patient at her own request and makes and delivers to her counsel a written report of his findings, to aid her counsel in the presentation of her cause, is privileged under the California statute which makes privileged in civil actions any information acquired in attending a patient which was necessary to enable a licensed physician "to prescribe *or act* for the patient." In any event, since the patient caused herself to be examined and a report to be made to aid her counsel in the presentation of her cause, the information obtained by her physician was privileged under the statute that confers a privileged status on communications between an attorney and the agent of his client, the same as to communications passing directly between an attorney and his client. Although the statutes provide that a person who brings action to recover damages for personal injuries thereby consents that any physician who has prescribed for or treated him and whose testimony is material in the action shall testify, a patient who brings such an action does not waive his privilege with respect to information obtained by a physician employed by the patient, not to prescribe for or treat him, but to act for him in the making of an examination to aid in the prosecution of the patient's cause.[1]—*Webb et al. v. Francis J. Lewald Coal Co. et al. (Calif.), 4 P. (2d) 532.*

Compensation of Physicians: Liability of Third Person on Promise to Pay Another's Medical and Hospital Bills.—Where medical and hospital services have been rendered an adult on the oral promise of the adult's father to pay the "bills incurred at the hospital," the father is liable therefor. The fact that the promise was oral and not in writing does not bar the action; the statute of frauds denying recovery on an oral promise to pay the debt of another person does not apply. The father's promise was made before the services were rendered or any debt therefor created, and the credit was extended solely to him. His promise to pay, therefore, was original and not within the statute.—*Drummond v. Pillsbury; State Street Hospital v. Same (Me.), 156 A. 806.*

Charitable Hospitals: Liability for Burn by Hot Water Bottle.—A charitable institution conducting a hospital solely for philanthropic and benevolent purposes is not liable to a pay patient for damages sustained by reason of a burn caused by the negligent placing of a hot water battle.—*Sibilia v. Paxton Memorial Hospital (Neb.), 238 N. W. 751.*

Society Proceedings

COMING MEETINGS

American Congress of Physical Therapy, New York, Sept. 6-10. Dr. F. B. Balmer, 185 North Wabash Avenue, Chicago, Secretary.

Colorado State Medical Society, Estes Park, Sept. 8-10. Mr. Harvey T. Sethman, 227 16th Street, Denver, Executive Secretary.

Wyoming State Medical Society, Rock Springs, July 18-19. Dr. Earl Whedon, 50 N. Main Street, Sheridan, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS

Forty-Seventh Annual Meeting, held at Atlantic City, N. J., May 3 and 4, 1932

(Concluded from page 166)

Further Studies on the Etiology of Simple Goiter

DR. DAVID MARINE, New York: The discovery was made by Chesney, Webster and others that feeding rabbits with cabbage often caused marked thyroid enlargement. It was felt that this provided a practical means for the further study of goiter. The material used was easily obtained and the animal an easy one to study. A search was made for the factor in cabbage that stimulated thyroid hyperplasia. Some of the facts that came out of the study were as follows: Dr. Webster found that there was a great seasonal variation in the constituents of cabbage. Spring and summer cabbages were inert. Autumn cabbage may be inert but may cause hyperplasia. There are also annual variations. Cabbage was most potent in 1928-1929 and next in 1931. There is also a geographic variation, and different locations vary in different years. Iodine is not an important factor. There may be high iodine content with low thyroid stimulation. One can steam cabbage or boil it half an hour without impairing the goiter stimulant. Drying the cabbage entirely removes this product. Pressed juice is quite inactive. The cabbage cake left from pressing retains its full power. The substance therefore is not removed with the juice. Cabbage cake mixed with distilled water does not affect the water; therefore the substance appears water insoluble and other solvents must be sought. The ether extract has been found powerful. It is probable that all Cruciferae, such as cauliflower, rutabaga, mustard and broccoli, have this substance. It is possible that the substance is connected with the mustard oils or cyanide precursors. So far the mustard oils have given

1. Reversing Webb et al. v. Francis J. Lewald Coal Co. et al. (Calif.), 297 P. 958; J. A. M. A. 98: 578 (Feb. 13) 1932.

negative results. In the distillation of mustard oil from mustard meal, cyanide is carried over. Organic cyanide has been extracted from three of the Cruciferae by steam distillation. The inorganic cyanides (allyl, ethyl, phenyl) are highly poisonous. It was possible, however, to use acetyl nitrate. Injection of this hastened sexual maturity in the animals and stimulated the thyroid. Sometimes bilateral exophthalmos was produced as early as the twentieth day, sometimes not until the sixtieth day. Eighty per cent of the injected animals got hyperplasia, and 60 per cent got protrusion of the eye. The exophthalmos was not marked.

DISCUSSION

DR. JOSEPH MILLER, Chicago: Iodine in inorganic form may be stored in the thyroid. There is no doubt that a colloid storage of inorganic iodine occurs, but in hyperplasia of the acini the colloid must disappear. There is no longer storage of the inorganic iodine, which is then thrown into the circulation. This accounts for the symptoms in toxic goiter. It has not been explained why hyperplasia takes place. This work of Dr. Marine is interesting. With cyanide he can produce hyperplasia of the thyroid. This cyanide affects the cellular oxidation, which leads to the corresponding hyperactivity of the thyroid in the endeavor to counteract this. I should like to know what other materials besides cyanide lessen cellular oxidation. This opens up an interesting field in the etiology of hyperplastic goiter.

DR. G. A. HARROP, Baltimore: Has Dr. Marine any evidence that acetonitrile really alters respiratory metabolism? He spoke of enlargement of the suprarenal medulla. Is there any change in the cortex as well?

DR. A. M. CHESNEY, Baltimore: Was any correlation observed between the exophthalmos and the size of the goiter?

DR. DAVID MARINE, New York: In relation to the historical question, the idea that the thyroid compensates for lack of oxygen is an old theory. Low oxygen pressure has some effect on the thyroid as on cyanosis. The thyroid tries to overcome the block of tissue oxidation. In regard to Dr. Chesney's question as to exophthalmos in relation to large goiters, I don't think that the production of exophthalmos is rapid. As regards changes in the cortex, I think there is hypertrophy to some extent of the cortex, and in some animals there is hypertrophy of the ovaries, which is associated with hastening of the sexual function. As to whether there is any relation between the size of the goiter and the exophthalmos, goiters have not been produced larger than 1.5 Gm.; there is, however, a relation between the rapidity of the production of the goiter and the exophthalmos.

The Identity of the Thyroid Adenomas

DR. WILLIAM BOYD, Winnipeg, Manit.: My studies have distinguished three groups of goiter: (1) diffuse colloid goiter, or simple colloid goiter, (2) diffuse hyperplastic goiter and (3) adenomatous goiter. I have given especial attention to the third class. Benign adenoma is formed of epithelial tissue with glandular elements; the adenoma and the thyroid are sharply distinguished, but often the whole gland is converted into adenoma. The lesion is opaque, dense, and more elastic. The thyroid is a lobular organ, and its pathologic changes are similar to those of the breast. The lobule gets hyperplastic and then undergoes involution. I do not call this neoplastic. It is a colloid nodular lesion. In regard to fetal adenoma, it is suggested that there are new growths of epithelial cells between the acini. Some workers regard these as fetal rests. Acini are separated by interacinous material. There is also an extra-acinous budding characteristic of fetal adenoma. One of the fundamental signs of fetal adenoma is degeneration caused by fading of the acini into interacinous material, probably caused by interference with the vascular supply. I have spoken of fetal and of colloid types, but the difference is not really fundamental. I believe the fetal form is a degeneration of some other form. From this morphologic consideration follow these conclusions: (1) The identity of ordinary thyroid adenoma as a true neoplasm may be seriously challenged; (2) the cycle of changes by which the thyroid responds is goiter, although the final picture may be altered beyond recognition. This work is not original. Dr. Marine's studies preceded mine by many years.

Further Studies on the Action of the Suprarenal Cortical Hormone

DRS. GEORGE A. HARROP, JR., and ALBERT WEINSTEIN, Baltimore: During the past two years we have treated nine cases of Addison's disease with suprarenal cortical extract (Swingle-Pfiffner). From July, 1930, until July, 1931, our extract was supplied from Princeton by Drs. Swingle and Pfiffner. Since that time we have prepared it ourselves, and our material has had the same potency as that prepared at Princeton when assayed by determining the minimal kilogram dosage required for maintenance of adult suprarenalectomized dogs. No toxic effects whatever have been observed either on animals or in the clinic as a result of many hundreds of injections. However, we do not doubt that unskilfully or carelessly made preparations of the material may result in a toxic product. Recently we have been using extracts prepared from whole beef suprarenal, which has from 10 to 20 times the potency per cubic centimeter of the extracts as originally prepared from dissected cortex alone. This material may be used in at least one-tenth the dosage of the original extract. Instead of from 50 to 100 cc., only 5 to 10 cc. is required to treat the average patient successfully in relapse.

In the treatment of nine cases of Addison's disease there have been five deaths; in three, autopsy revealed marked or complete cortical atrophy; in one, bilateral suprarenal tuberculosis. Four patients are living, three in good condition with somewhat restricted activities. Our results indicate a relatively better effect on patients treated early in the disease and in those having few or no relapses. We think it quite possible that further damage is produced on the portions of the cortex still intact as a result of each successive period of relapse. There is absence of striking effect on weight or blood pressure, with the earlier type of extract made from cortex alone. Our further experience confirms the fact of the bad effect of measures that raise metabolism, such as fever, thyroid extract or exhausting exercise, and we stress the importance of accessory therapeutic measures, as rest, warmth, fluids and the use of dextrose.

The pathologic effects of cortical insufficiency may be illustrated by the clinical history and autopsy observations in an animal that was maintained on cortical extract for one year after bilateral suprarenalectomy and then allowed to die in suprarenal insufficiency uncomplicated by infection. The results of this autopsy showed malnutrition and atrophy of the internal organs. There was no glandular or thymus enlargement, congestion of the pancreas or important changes in the intestinal tract. It did show a gastric ulcer, which is common in dogs in the locality of Baltimore. Gastric ulcer is not common or characteristic in our dogs dying of suprarenal insufficiency. None of the endocrine glands were affected in an unusual way. The thyroid showed marked hypoplastic changes and there was central atrophy of the liver. The general picture was that of malnutrition and the atrophic changes characteristic of that condition. There was no evidence of stimulation of the thyroid.

In a given animal the minimal maintenance extract requirement varies with metabolic activity. Factors that increase metabolism (fever, exposure to cold, exercise and the injection of thyroid extract) increase the extract requirement or induce insufficiency. This is analogous to what is seen in patients with Addison's disease.

Further Studies in Addison's Disease

DRS. L. G. ROWNTREE and CARL H. GREENE, Rochester, Minn.: Our material was obtained from Dr. Swingle. We have treated thirty-two patients between June, 1930, and June, 1931. In the beginning we had difficulties with reaction from toxic products, but during recent months the material has been nontoxic. Our results have shown (1) relief of anorexia, nausea and vomiting, and gain of appetite; (2) relief of fatigue and increase of strength; (3) disappearance of pain and improvement in sleep; (4) decrease in pigmentation; (5) gain in weight; (6) return of normal gastro-intestinal activity, and (7) change in blood pressure. We have found also that resistance to infection has been improved. These patients are extremely susceptible to infection. One man had an acute septic pneumonia. He was given large doses and made an uninterrupted recovery. In a control group of patients with various types of asthenia the results were negative, showing the specific nature of the hormone.

DISCUSSION

DR. L. H. NEWBURGH, Ann Arbor, Mich.: I should like to ask the authors what method they used to determine the diagnosis. It is difficult to make sure one has an example of Addison's disease. There must be some sign that they rely on.

DR. J. C. AUB, Boston: Many years ago, when working on the suprarenal, when I removed the gland, if the physiologic dose of epinephrine was given the metabolism returned to normal. The effect of epinephrine control was studied. I should like to know the relationship of these observations to the present work. What is the relation between the cortex and epinephrine and the metabolic processes in which both products occur?

DR. GEORGE A. HARROP, JR., Baltimore: I think I should lay stress on the fact that the observations that I have reported were made on animals operated on and allowed to get along on maintenance doses to avoid any complication to the surgical shock. That is extremely important. These operations were done on animals in which there can be no question of complications arising as the result of the operation or of the anesthetic. I have not found prolonged rise in the basal metabolism as the result of injection of epinephrine. The results have not been an evanescent rise in metabolism. The results are constant and have lasted during employment of the procedure. One other point, there is a curious cachexia or undernutrition that sometimes follows injections, just as in severe distemper, in these animals. They appeared markedly undernourished, lost fat, and showed marked evidence of anorexia There was marked lowering of the basal metabolism.

DR. CARL H. GREENE, Rochester, Minn.: The question of diagnosis is difficult. We have accepted only those cases in which we were certain beyond all question. Many patients have some weight loss, some asthenia, hypotension, and some pigmentation after infection. I agree that it is hard to distinguish these cases. In Addison's disease, in many patients there is tremendous loss of weight, sometimes as much as 65 pounds (29.5 Kg.); the average is 35 pounds (16 Kg.). The skin looks smooth, yet there is a great loss of weight. The lips, gums and palate show pigmentation. There is hypotension, and often there is evidence of past tuberculosis, which is always suggestive. We have found evidence of calcification in six out of twenty cases. At autopsy we found that 30 per cent of cases showed evidence of tuberculosis. Calcification is not significant in doubtful diagnosis. The therapeutic response can be used as a diagnostic aid in doubtful cases. When the patient makes distinct clinical improvement under therapy, it shows that he has Addison's disease.

Studies in Diabetes Mellitus

DR. L. H. NEWBURGH and DOROTHY S. WALLER, Ann Arbor, Mich.: Many observers have noted that considerable amounts of carbohydrate may be added to the diet of the diabetic patient without causing glycosuria or increasing the need of insulin when the dietary fat is also sharply reduced. This phenomenon has been attributed to (1) stimulation of carbohydrate metabolism by carbohydrate, (2) interference with metabolism of carbohydrate by fat, (3) or by excessive intake of calories, and (4) the existence of a nutritional principle, hitherto unrecognized. This welter of conflicting suggestions may be reduced to a few simple quantitative statements by first studying diabetic patients who do not require insulin, and later by dealing with severer types to whom insulin must be administered. In that way it was shown that the inherent maximal capacity of a diabetic patient to dispose of the total available dextrose without glycosuria is unrelated to the type of diet. It is not reduced by fat or augmented by carbohydrate. It was further shown that the capacity of insulin to cause the metabolism of dextrose varies in response to two factors: (1) the total amount of dextrose to be acted on, and (2) the ratio between dextrose and insulin. For example, in a patient whose tolerance was 174 Gm. of dextrose, the addition of 14 Gm. of dextrose required 10 units of insulin. Hence, each unit disposed of 1.4 Gm. of dextrose. As the carbohydrate of the diet was further increased, insulin became progressively more efficient until 1 unit disposed of 7 Gm. of dextrose when the latter exceeded the tolerance by 100 Gm. Finally, it was shown that further increases in carbohydrate beyond this point were not attended by further increase in the efficiency of insulin. A sharp maximum had been reached.

Treatment of the Same Diabetic Patient with Widely Varying Diets

DRS. SOLOMON STROUSE and SAMUEL SOSKIN, Chicago: We have frequently made the observation that, under the controlled conditions in the Max Pam Metabolism Unit of Michael Reese Hospital, the diabetic manifestations of our patients could be kept well under control by many dietary systems. Since the discovery of insulin an increasing breadth of possibilities regarding food intake has been recognized. Patients wandering from clinic to clinic do equally well under widely varying diets, perhaps because of some common denominator, such as a comparatively low calory intake.

Our patients were maintained in the metabolism unit throughout the entire period of these experiments. Each patient was treated with three successive isocaloric diets: (1) relatively high in carbohydrate, (2) relatively high in fat, and (3) relatively high in protein, respectively. During each period sufficient insulin was given to control the diabetic manifestations to about the same degree, but we purposely did not attempt to render the urine entirely sugar free. The diets varied widely in composition, more widely than would be the case in therapeutic diets encountered at different clinics, but not as widely as possible, in order to avoid untoward subjective reactions of the patients. The order in which the diets were given varied in the different patients. The change from lower to higher available carbohydrate usually was made in transitional steps, but the reverse change usually was abrupt.

A study of the charts shows that diabetic manifestations of all patients were adequately controlled on the various diets and there is nothing to indicate that each of these diets could not have been continued indefinitely. Subjectively, almost all the patients preferred the high carbohydrate diet. The insulin requirements during the high fat diets were not quite half that of the other periods but, considering the extreme range of our diets, a comparison of the carbohydrate tolerance and insulin coefficient during these periods shows the remarkable flexibility in management allowed by a small difference in insulin. From the standpoint of the patient who has to receive insulin, it makes little difference whether 17 or 33 units is injected during the day.

It seems to us to be axiomatic that, in all dietetic therapy, the goal should be as near an approach to the normal diet as is consistent with the underlying pathologic conditions. All our patients required insulin and it is to such patients that our remarks are particularly directed. Our experiments reveal no reason for imposing markedly abnormal or disproportionate dietary mixtures on the diabetic patient. They further show that the diabetic manifestations of many patients can be equally well controlled on widely varying mixtures. The effort to approach a normal diet for such patients would therefore seem logical.

If this is so, the dietary objective in the diabetic patient treated with insulin should be to meet the demands of an individual leading a full normal life. In most instances of uncomplicated diabetes this can be accomplished by a comparatively simple study of the individual patient's needs and desires and the demands of his diabetes. In other words, we believe that the problem of feeding insulin treated diabetic patients does not involve the application of formulas or strict adherence to any particular type of diet. Since these patients do equally well on widely varying diets, the question involved is not one of high fat or high carbohydrate but of a well balanced, comparatively normal regimen.

DISCUSSION

DR. ELLIOTT P. JOSLIN, Boston: I quite agree with the conclusions of the authors. It isn't necessary to go to extremes in diet. I think a change is useful. I think it would be interesting if Dr. Newburgh would tell what his carbohydrate is that the average patient takes now. I know his cases because I have had the same experience. I don't think any of the men who advocate high carbohydrate diet are here, but I have come to believe that much more carbohydrate should be given than is customary. A year ago at the Deaconess Hospital 143 Gm. was given and this year 144. It seems to me that

digestion was better. Most physicians have tried to avoid extremes in diet.

DR. F. M. ALLEN, Morristown, N. J.: I think certain points should be made clear, which may be missed. High carbohydrate diet depends on the question of insulin. In the days before insulin it was not so material whether one gave high carbohydrate, but if one exceeded a certain limit one lost his patients. Now the difference in the patient's diet depends on the insulin dosage. On the one hand is the tolerance of the patient and on the other the pharmacology of insulin. Even with insulin the tolerance may be broken down. As regards the experiments of Drs. Strouse and Soskin on the high caloric diet they are correct. That idea was worked out ten years ago. Fat people and thin people react differently to insulin. Obese persons need more insulin. Insulin has some relation to carbohydrate. I don't know its function. Up to the present no direct reaction between insulin and carbohydrate has been demonstrated. It is not known whether it acts on carbohydrate alone. This is markedly shown when amounts are varied. The relation of insulin to body weight is invariable, but its relation to dextrose differs greatly. When I was planning to use insulin in tuberculosis, I gave 1,000 units per kilogram but did not find any definite relation of insulin to carbohydrate alone.

DR. HERMAN O. MOSENTHAL, New York: The relation between insulin and carbohydrate can be stated in this way, that proportionately better results are obtained from small doses of insulin than from large doses. The amount of carbohydrate digested is larger with smaller doses. One such example was the case of a boy not sugar free with three doses of 50 units, but when he was given 10 units four times a day he became sugar free on the same diet. Sugar tolerance depends on the renal threshold of dextrose. That has not been worked out. On the old starvation diet, it was lower than with the high fat diet. With high starch diet or high protein diet there was a renal threshold of 200 before dextrose appeared. Many patients tolerated the high starch diet well and did better than when they were on the ordinary diet. If they are on the high starch diet and they get diminished tolerance for dextrose with the same dose of insulin, changes have to be made to a lower starch diet to reinstate the tolerance.

DR. CAMPBELL, Toronto, Ont.: Diets high in carbohydrate are not successful if they lack the basal dextrose requirements. This is not adequate therapy for diabetes. The diabetic patient needs to be brought back to sufficient caloric intake to restore his economic status. Calories are important in the treatment of the diabetic patient. Some of these high carbohydrate diets may be too high. It is necessary to have the patients studied for six months and have them come back several times to be tested. In certain cases they may appear to do well on a high carbohydrate diet for two weeks, but if it is carried out longer it may destroy their tolerance. A high carbohydrate diet must be tested out for a longer period.

DR. L. H. NEWBURGH, Ann Arbor, Mich.: In answer to Dr. Allen, I began to use a high fat diet in 1918. My associates and I have had continuous experience with it ever since. I had a young physician with severe diabetes on that diet for nine years, without any change in the plan and without change in the dosage of insulin. The condition was the same as if he had become stabilized. We have had many patients on the high fat plan for many years and we cannot see any harmful effects. We have before us an ideal which requires us to avoid the use of insulin whenever we can. We begin with low carbohydrate, 1,000 calories, chiefly consisting of fat, and then go up gradually till we reach the tolerance of the patient. If we reach tolerance without insulin we give carbohydrate with insulin. If the patient wants more carbohydrate he can have it if he wants to be burdened with insulin. There is a relation between a large amount of dextrose to be acted on and the amount of insulin. We do not give more than we can deal with with small amounts of insulin, but we know that it will not take more insulin for 100 Gm. of dextrose than for less than that amount. We give as much carbohydrate as we can control with the insulin.

DR. SOLOMON STROUSE, Chicago: We used exaggerated types of diet to prove some points. Patients receiving insulin are placed on a moderate diet that approaches the normal as nearly as possible. With the use of insulin one can give the patient a diet as nearly normal as possible with sufficient calories, a diet that the patients ask for.

The Relation of Blood Sugar to Plasma Cholesterol

DR. HERMAN O. MOSENTHAL, New York: Certain factors will influence the plasma cholesterol level in diabetes mellitus:

1. Acidosis raises the plasma cholesterol remarkably. 2. Malnutrition lowers the plasma cholesterol. 3. High fat diet over a long period elevates the plasma cholesterol.

These facts are well established but they do not necessarily exclude variations in the blood sugar as an influence on the plasma cholesterol. This relationship was investigated by determining simultaneously blood sugar and plasma cholesterol values in persons while fasting and, subsequently, at intervals of 20, 40, 60 and 120 minutes after the ingestion of 100 Gm. of dextrose. Ninety-five observations in all were carried out. Controls showed that the maximal deviation of plasma cholesterol in the absence of the eating of sugar was $\pm$ 7.8 per cent. Any variation above or below this amount was considered either an increase or a decrease secondary to the ingestion of sugar.

It was found that as the blood sugar rose the plasma cholesterol would either rise, remain unchanged or diminish. In one case the plasma cholesterol rose 107 mg. (from a control of 193 to a level of 300), and in one case it fell 82 mg. (from a control of 270 to a level of 188). In persons with a normal sugar tolerance, sixty minutes after the taking of dextrose, the plasma cholesterol rose in 45.4 per cent of the cases, remained constant in 40 per cent and diminished in 14.6 per cent. In subjects with a diminished sugar tolerance, the plasma cholesterol, in two hours, dropped or diminished in 40.5, remained constant in 29.9 and increased in 29.8 per cent.

The effect of the blood sugar on the plasma cholesterol appears to be influenced by two forces:

1. A compensatory osmotic effect that would tend to lower the plasma cholesterol as the blood sugar rises.

2. Some factor that elevates the plasma cholesterol, which presumably is associated in some manner with the metabolism of dextrose.

A rise in blood sugar may therefore be regarded as having an influence on the level of the plasma cholesterol. The relation between the blood sugar and the plasma cholesterol in any case of diabetes mellitus is difficult to interpret because the plasma cholesterol may either rise or fall as the blood sugar increases and, furthermore, because there are other influences (acidosis, malnutrition, high fat diet), which modify the concentration of the cholesterol in the plasma.

DISCUSSION

DR. ELLIOTT P. JOSLIN, Boston: I think it is difficult to draw conclusions about the influence of dextrose on the plasma cholesterol, between our friends Drs. Allen and Newburgh. I have one of Dr. Allen's patients under my care who was treated before insulin was discovered. He insists on keeping to the old treatment of 50 Gm. of carbohydrate. His plasma cholesterol a year ago was 223 mg. and this year it is 219 mg. He has lived on a high fat diet and refuses insulin. He preaches every Sunday and does so well that I do not want to break in and change his diet. These experiments of Dr. Mosenthal may throw more light on the subject. He mentioned arteriosclerosis. I think that diabetic children who have grown up since insulin was discovered do not show arteriosclerosis as did the previous group. This is an encouraging factor. These children have not shown cataracts either. About 80 per cent of the cases show a higher plasma cholesterol than normal.

Conservative Treatment of Gangrene of the Feet by a Selected Temperature, Oxygen and Desiccation

DRS. ALFRED STENGEL and ISAAC STARR, JR., Philadelphia: The fact that persons with peripheral vascular disease come to the hospital chiefly in the winter suggested that the environmental temperature must play an important part in the pro-

duction of acute lesions. So the effect of temperature on the circulation of the feet of such patients was studied. Eleven cases with gangrene or ulcers of the feet were chosen. The lower extremities were placed in a water or air bath and the temperature was slowly raised. Skin color was recorded by the scale of Lewis. At temperatures under 30 C. the feet showed varying degrees of cyanosis and the patients complained of pain. Between 33 and 35 degrees, pain diminished or disappeared and the color of the feet most closely approached the normal. Above 35 C., cyanosis reappeared and pain returned.

Therefore we have employed a temperature of between 30 and 35 C. in the treatment of these conditions, maintaining it around the feet day and night by means of a thermoregulated foot cradle. Under such conditions some patients preferred temperatures differing slightly from that which they chose in the acute experiment, so we have used between 32 and 37.5 C. for prolonged treatment. All patients agreed that they were more comfortable than before this temperature was employed, and in about half the cases relief was complete within a few days. In three cases in which surgeons had amputated toes but had been unable to secure healing of the wound, such healing took place. Failure to relieve pain was encountered when the gangrene was ascending, so we sought other methods.

Oxygen was used as a means of local treatment. Seven patients with gangrene had their feet placed in jars in which the oxygen content was slowly raised to 80 per cent, at which point relief was obtained. The cover of the jar was bandaged to the knee in such a manner that concentration was maintained. Gangrene was not stopped but pain was relieved. Calcium chloride was placed inside the cradle, so that the feet were in warm dry air. Wet gangrene was noted only when the toes touched and the air did not reach. When the toes were kept apart, the gangrene dried up and hardened.

One patient, who could not be operated on because of congestive heart failure, had embolic gangrene and was treated for two months. A line of demarcation of gangrene formed below the knees and deepened to the bone. The treatment could not be continued because the stumps became infected, so they were amputated below the knee without anesthetic or pain. The stumps were cleaned up with maggots. They were healed and granulating one month later, when the patient died of decompensation. We believe that the use of these conservative methods will lead to the preservation of much tissue which is at present lost because the amputation must be performed so far above the level of the lesion.

The Clinical and Pathologic Picture of Follicular Lymphoblastoma

DR. GEORGE BAEHR, New York: Attention is directed to the occurrence of a variety of lymphadenopathy and splenomegaly that is characterized clinically by a prolonged course, a normal blood picture and freedom from fever, cachexia, profound anemia and other constitutional manifestations until late in the disease. The enlargement of the lymph nodes and of the spleen is due to the production of huge lymph follicles, which present the appearance of enormously enlarged germinal centers, composed of lymphoblasts and prelymphoblasts, surrounded by a narrow zone of small, darkly staining lymphocytes. Follow-up observations in nineteen cases indicate that the condition is a distinctive variety of lymphosarcoma which may manifest more malignancy and invasive characteristics later in the disease. It is therefore designated follicular lymphoblastoma.

At the stage in which most patients first come under observation the microscopic picture of an excised lymph node gives the appearance of being related to the systemic hyperplasia of the lymphatic tissue, and the pathologist is apt to be fortified in this interpretation of the process by deceptively reassuring reports of the clinical observations. On the other hand, when the case is not seen until late in the disease, or at necropsy, the gross appearance of the lymph nodes suggests ordinary lymphosarcoma. Thus the histologic architecture and the unusual clinical features may be overlooked. The remarkable radiosensitivity of the growth is due to the fact that it is allied ontogenetically to normal lymphatic tissue, the body tissue most sensitive to gamma rays. The disease should be classified in a distinct manner because it is so responsive to irradiation in the early stages.

DISCUSSION

DR. WILLIAM BOYD, Winnipeg, Manit.: Dr. Baehr has made a differentiation in his conclusions. He has differentiated the lymphocytes and the reticulo-endothelial cells. He has spoken of hyperplasia of the germinal centers. Many people regard these cells as of the reticulo-endothelial type. I should like Dr. Baehr's opinion as to whether sarcomas of that type respond to irradiation.

DR. GEORGE BAEHR, New York: The primitive mesenchymal cell is differentiated into two types, the reticulo-endothelial cells and the lymphoblastic cells. This differentiated reticulocyte is one of the cells most resistant to the x-rays. The lymphoid cell is one of the most sensitive to radiotherapy. We believe as a result of cytologic observations that the type of cell here involved is differentiated from the primitive type of mesoblastic cell, which is a kind of lymph cell rather than a reticular cell. That may explain the remarkable pathologic picture and clinical course and also explain the remarkable sensitivity of the cells to the x-rays.

Further Studies on the Mechanism of Pain in Gastric and Duodenal Ulcer

DRS. WALTER L. PALMER and T. E. HEINZ, Chicago: In our studies on these patients we have found that they can be kept free from pain if the free hydrochloric acid is kept at zero. In a case of duodenal ulcer, the patient was extremely sensitive to pain; the dosage of 1 mg. of atropine did not minimize the pain, but washing out the acid immediately gave relief of pain. We have found that when the patient's own gastric juice touches the ulcer it causes pain. We have tried to desensitize to pain by injections of calcium chloride intravenously. They may relieve pain but they cause nausea. However, one can keep the patients free from pain by keeping the gastric juice neutralized.

Observations on the Experimentally Produced Pathology of the Liver

DR. FRANK C. MANN, Rochester, Minn.: My associates and I have carried out a series of investigations on the experimental pathology of the liver. The purpose of these investigations was twofold: First, to produce chronic hepatic insufficiency and to study the various functions of the liver in conditions that would simulate pathologic states found in the human being. Second, to determine some of the factors producing the various pathologic changes noted in the liver.

It soon became apparent that if the various pathologic changes produced in the liver were to be understood, it was essential to determine the cause of the most outstanding characteristics of the organ: its remarkable power of restoration after injury or partial removal. Restoration of the hepatic tissue after injury by any of the common hepatic poisons is usually rapid and complete. A more striking way of showing the capacity of the liver for restoration is by a study of the effects of partial removal of the organ. A large percentage of the organ can be removed from an animal and in a few weeks the remaining portion has increased to an equal or even greater size than the original organ. It is obvious that this characteristic of the liver is of fundamental importance in the development of hepatic lesions. A physiologic need for hepatic tissue has usually been the factor ascribed for the quick and complete restoration of the liver after partial removal. The results of our investigations indicate that the major factor causing restoration of the liver after partial removal is the portal circulation. This statement is based on the following facts: 1. Restoration is decreased following partial occlusion of the portal vein in rats. 2. It is usually altogether absent in a dog with an Eck fistula. 3. It is usually absent in the chicken, in which species there is a natural anastomosis between the portal and the systemic venous system. However, if the blood flow through the liver of this species is increased by occlusion of the post cava, restoration occurs to a marked degree. 4. Restoration does not occur in dogs in which a stoma between the vena cava and the portal vein is made without the ligation of either vessel.

Current Medical Literature

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Titles marked with an asterisk (*) are abstracted below.

American J. of Obstetrics and Gynecology, St. Louis

23: 461-618 (April) 1932

*Value of Various Kidney Function Tests in Differentiation of Toxemias of Pregnancy. H. J. Stander, P. Ashton and J. F. Cadden, Baltimore.—p. 461.

*Microscopic Cerebral Hemorrhage in Stillbirths and New-Born Deaths: Study of Fifty-Three Infants with Relation to Minute Hemorrhages of Medulla Oblongata. F. A. Hemsath, New York, and Myrtelle M. Canavan, Boston.—p. 471.

*Osteomalacia in Pregnancy. W. J. Dieckmann, Chicago.—p. 478.

*Menorrhagia Due to Hypothyroidism. W. C. Waters and G. A. Williams, Atlanta, Ga.—p. 489.

*Induction of Labor at Term. J. M. Slemons, Los Angeles.—p. 494.

*Analysis of One Hundred and Fifty-Eight Cases of Placenta Praevia. H. L. Moskowitz, New York.—p. 502.

Cesarean Section Statistics for City of Portland, Oregon, from 1926 to 1929. T. W. Adams, Portland, Ore.—p. 511.

*Study of Menstrual Histories of Two Thousand Two Hundred and Eighty-Two University Women. Ruth E. Boynton, Minneapolis. —p. 516.

Obstetric Transverse Diameter: Significance of Its Measurements by Roentgen-Ray Pelvimetry. W. C. Stude and V. E. Scherman, St. Louis.—p. 524.

Anaerobic Streptococci in Vagina of Normal Clinic Patients. S. D. Soule and T. K. Brown, St. Louis.—p. 532.

Mid and High Forceps: Report of Five Hundred and Thirty-Five Consecutive Cases. H. S. Acken, Jr., Brooklyn.—p. 538.

*Importance of Posture of Cardiopath During Pregnancy and Labor. L. Rudolph, Chicago.—p. 546.

Placenta Circumvallata: Theory of Formation Including Relationship to Normal Placenta, to Placenta Marginata and to Placenta Membranacea: Preliminary Report. R. Torpin, Chicago.—p. 551.

Bacteriology and Pathology of Chronic Cervicitis. H. O. Maryan, Chicago.—p. 555.

Some Observations on Aschheim-Zondek Test in Diagnosis of Pregnancy. M. E. Davis and H. W. Ferrill, Chicago.—p. 567.

Diathermy in Treatment of Gonococcus Cervicitis and Urethritis. T. J. Williams, Great Falls, Mont.—p. 575.

Tuberculous Endometritis: Report of Cases. A. Heinrich, Brooklyn. —p. 579.

Endometrioid Heterotopias of Umbilicus. O. W. Longwood, Stafford, Kan.—p. 582.

Dystocia Due to Contraction Rings of Lower Uterine Segment: Report of Three Cases. J. T. Wallace, New York.—p. 589.

*Oral Administration of Sodium Amytal in Eclampsia. E. C. Hamblen and D. O. Hamblin, University, Va.—p. 592.

"Ascending" Intra-Uterine Polyp. R. A. Lifvendahl, Chicago.—p. 594.

Spontaneous Rupture of Uterus at Three and One-Half Months' Gestation. R. S. Smylie, Santa Cruz, Calif.—p. 595.

Intrapelvic Tubal Insufflation Syringe. F. W. Sovak, New York. —p. 596.

Atomizer for Vaginal Antisepsis During Labor and Vaginal Medication in Gynecologic Practice. C. E. Ziegler, Pittsburgh.—p. 600.

Kidney Function Tests in Differentiation of Toxemias of Pregnancy.—Stander and his associates report that of the Mosenthal, phenolsulphonphthalein, diastase, thiosulphate, urea concentration factor, urea clearance, guanidine and creatinine excretion tests, the latter three proved of real value in the differentiation between mild nephritis and the other toxemias of pregnancy. They recommend the urea clearance and creatinine excretion tests for routine use in all cases of toxemia of pregnancy in which the diagnosis is not clear. A urea clearance of below 80 per cent of the mean normal, and a creatinine excretion below 155 mg. in the first hour, are strongly indicative of renal damage.

Cerebral Hemorrhage in Stillbirths and Deaths of New-Born Infants.—In microscopic examination of a single or two sections of the medulla oblongata in stillbirths and dead new-born infants, Hemsath and Canavan found microscopic hemorrhages in thirty-four instances (64 per cent) among an unselected series of fifty-three necropsies. In twelve cases this observation supplied an anatomic cause of death that would otherwise have been lacking.

Osteomalacia in Pregnancy.—According to Dieckmann, osteomalacia must have an earlier stage than the one which is characterized by marked deformities of the bones. The diagnosis should be made on the symptoms and evidence of calcium deficiency, as determined either by metabolism studies or by an analysis of the diet. The serum calcium need not be subnormal to warrant a diagnosis of osteomalacia, nor do the bones in the early stage show any signs of absorption perceptible to the roentgen ray. There is a definite association between pregnancies at short intervals, insufficient or improper diet and the occurrence of pain in the symphysis, back and thighs, and difficulty in walking. The diet of the pregnant woman should be carefully supervised in that it should contain sufficient calcium and phosphorus, butter and milk, and fresh vegetables and fruits for the vitamin content. In many patients, especially when there is an economic problem, the diet should be supplemented with calcium and cod liver oil. This applies in particular to the Negro race. The result will be that the women will have less disability because of calcium deficiency and less decay and softening of teeth. The baby will be started with its proper store of calcium and phosphorus and will be less liable to develop rickets. Furthermore, since the deciduous teeth are formed in utero, they will have their proper composition and be less likely to decay.

Menorrhagia Due to Hypothyroidism.—Waters and Williams state that excessive bleeding is the menstrual disturbance most frequently associated with hypothyroidism, amenorrhea rarely, if ever, occurring when the thyroid alone is deficient in function. In patients of any age whose menorrhagia cannot be attributed to pathologic changes in the pelvis, a therapeutic test with thyroid administration should be given before more radical measures are instituted. Definite hypothyroidism may occur in the presence of an apparently normal basal metabolism. The importance of the basal metabolic rate has been overemphasized in the diagnosis of variation in thyroid activity; disturbance of metabolism should be accepted only as one evidence of disease. Clinical acumen remains the principal agent of the physician in the detection of thyroid disturbances and cannot be supplanted by any laboratory procedure. The response of the symptoms of hypothyroidism, including menorrhagia, to substitution therapy furnishes the most reliable evidence that the thyroid is deficient in function.

Induction of Labor at Term.—Slemons' method of induction of labor at term consists in the rupture of the membranes and the intranasal application of pituitary extract after the preliminary administration of castor oil and quinine. Each of these steps is a familiar procedure, used independently to bring on labor. Each proves quite satisfactory, when effective; but one cannot predict when it will be so. On the other hand, the three procedures employed in succession may confidently be relied on. Since the method runs counter to orthodox obstetric teaching, certain comments of a theoretical character are made briefly in conclusion. The author refers to the mechanism of cervical dilatation, which is ascribed, almost axiomatically, to the action of a hydrostatic wedge composed of the membranes and the amniotic fluid. This medium, it is assumed, transmits the force of the uterine contractions and pushes aside the cervical barrier of the birth canal. In the author's judgment, that hypothesis is disproved, as far as negative evidence can do so, by the course of labor following induction by rupture of the membranes. Deprived of the possible action of such a mechanism, 132 labors suffered no handicap with regard to the first stage and terminated successfully. Nor did the presenting part of the fetus act as a substitute for the hydrostatic wedge. This contingency was kept in mind and excluded by careful, frequent rectal examinations during labor and by the later inspection of the infant's head, which presented merely the usual molding and but rarely a caput succedaneum. The development of cephalematomas did not occur in a single instance.

Placenta Praevia.—On the basis of an analysis of 158 cases of placenta praevia, Moskowitz believes that both maternal and fetal mortality can be considerably reduced if proper supervision of all bleeding cases is given early, while the patient is in good condition, rather than attempting to temporize too long. All vaginal examinations should be avoided, unless one is prepared to treat the patient immediately, for it may result in

severe hemorrhage difficult to control. Every effort should be made to conserve blood and combat shock. If shock and hemorrhage are present, they should be treated first and labor induced if pains have not begun. Manual dilation of the cervix followed by version and extraction gives a high maternal and fetal mortality, and this form of treatment should be condemned. The routine insertion of a bag extra-ovularly in marginal and partial cases of placenta praevia has given satisfactory maternal results and has lowered the fetal mortality considerably. On account of the high fetal mortality due to prematurity and prolonged bleeding, the mother should receive first consideration. In all types of placenta praevia following the expulsion or removal of the placenta, the uterus should be firmly packed with iodoform gauze so as to favor contraction and retraction of the uterus. Frequently, on failure to observe this rule, relaxation of the uterus will occur which will result in a serious and sometimes fatal hemorrhage from one to several hours post partum. Blood transfusion is indicated in all patients who have a low red blood count, low hemoglobin, and a systolic blood pressure below 90, following hemorrhage and shock. During the past five years since this procedure has been more definitely used as a prophylactic measure in antepartum, intrapartum and postpartum cases, not only have the maternal and fetal results improved but the morbidity has been lessened and convalescence hastened.

Menstrual Histories of University Women.—Boynton presents a study of the observations in the menstrual histories and physical examinations of 2,282 university women. The incidence of dysmenorrhea was 20.38 per cent. The percentage of dysmenorrhea increased as the age increased up to 20 years, with a significant increase between the groups under 20 years and those over 20. The incidence of dysmenorrhea was lowest in the freshman year. In a small group of student nurses the proportion of dysmenorrhea was 6.98 per cent, compared to 20.38 per cent for the university women. The size of the town in which the student has lived has no relation to dysmenorrhea. The amount of physical exercise as reported by the student has no significant relationship to dysmenorrhea. Posture has no significant relation to dysmenorrhea, although the percentage of dysmenorrhea in the poorer posture groups was lower than in those with better posture. The mean systolic blood pressure, the mean height-weight percentage, and the mean hemoglobin percentage was significantly lower for those having dysmenorrhea than for the group having no pain. The mean vital capacity percentage was slightly higher for the dysmenorrhea group. The percentage of cases having dysmenorrhea was greatest in the lowest blood pressure group, the lowest height-weight percentage group and the lowest hemoglobin group. The percentage of dysmenorrhea occurring in a group of students who were classified as "high strung" was lower than in a control group not so classified.

Posture of Cardiopath During Pregnancy and Labor.—The principles involved in the management of the cardiopath are enumerated by Rudolph thus: (1) a thorough knowledge of the cardiorespiratory physiology as related to posture; (2) the use of every known aid in relieving the embarrassed heart of avoidable strain, and (3) to obtain the opinion of a cardiologist as to the condition of the cardiorespiratory apparatus, keeping in mind that the obstetrician on the basis of his obstetric judgment must decide when and how to intervene in a given case for the safety of the patient.

Sodium Amytal in Eclampsia.—Hamblen and Hamblin present the results of a study of six patients with eclampsia whose only sedation was received from the oral administration of sodium amytal. In all six patients the convulsions were immediately controlled. After the convulsions were controlled, sedation was maintained with relatively small doses of sodium amytal. None of the patients exhibited the depression of respiratory rate or the cyanosis which have been observed frequently in patients receiving large doses of morphine. No inhalation anesthesia was required for delivery of the patients. The babies were in good condition at delivery and did not require vigorous resuscitation. On the basis of their observations, the authors conclude that the convulsions of eclampsia can be controlled promptly and completely by the oral administration of sodium amytal without untoward effects on the mother or baby.

American Journal of Physical Therapy, Chicago

9: 1-28 (April) 1932

Elliott Treatment as Applied to Urologic Cases. C. T. Stone, New York.—p. 5.

Perfume Dermatitis: Case Report, with Review of Literature and Bibliography. H. Goodman, New York.—p. 16.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

27: 497-656 (April) 1932

*Results of Radiation Therapy in One Thousand and Twenty-Two Private Cases of Carcinoma of Breast from 1902 to 1928 (Including One Hundred and Twenty-Seven Cases in Which Radium and Roentgen Rays Were Combined). G. E. Pfahler, Philadelphia.—p. 497.

Occurrence of Roentgen Pleuropneumonitis in Treatment of Breast Cancer. R. H. Fike, Atlanta, Ga.—p. 509.

Postoperative Roentgen Therapy for Cancer of Breast: Report of One Hundred and Three Consecutive Cases. U. V. Portmann, Cleveland, —p. 513.

*Treatment of Metastatic and Inoperable Mammary Cancer, with Discussion of Certain Distinct Types of Metastasis. F. E. Adair, New York.—p. 517.

*Interstitial Use of Gold-Filtered Radon Transfixion Tubes in Treatment of Mammary Cancer. G. T. Pack, New York.—p. 532.

Interstitial Irradiation of Mammary Cancer, with Especial Reference to Measured Tissue Dosage: Supplementary Report. B. J. Lee, New York.—p. 547.

Roentgenologic and Legal Considerations of Fractures of Mandible. S. W. Donaldson, Ann Arbor, Mich.—p. 562.

*Some Unusual Pneumonias Associated with Aspiration of Fats and Oils in Lungs. J. W. Pierson, Baltimore.—p. 572.

*Osteopoikilosis (Disseminated Condensing Osteopathy). L. F. Wilcox, Detroit.—p. 580.

Mensuration of Heart and Chest in Left Postero-Anterior Oblique Position: Comparative Study: III. Correlative Measurements of Aortic Arch and Thorax. W. W. Fray, Rochester, N. Y.—p. 585.

Radiation Therapy in Carcinoma of Breast.—Pfahler's study is based on a review of 1,022 cases treated in his private clinic up to 1928. None of the patients were treated by radium alone, and only a small proportion received any radium treatment. In the author's opinion, radium is relatively more powerful for its local effects on cancer than the roentgen rays, but for deep effects or wide distribution it is of less value unless used in very large quantities and at a distance. The first course of treatment should always be as thorough and vigorous as possible, for there is no doubt that recurrences appearing after prophylactic irradiation are highly refractory to further irradiation. Since cancer of the breast is so generally a widely distributed disease, the author uses radium for intensive local effect and roentgen radiation for its wider and deeper distribution. For these reasons, he has been trying to combine the use of high voltage roentgen rays with radium according to Keynes' method in the treatment of primary carcinoma of the breast. His impressions from this combination are favorable, but his experience is too limited and too recent to be considered in any detail.

Treatment of Mammary Cancer.—Studies made by Adair of the inoperable or "hopeless" cases of cancer of the breast reveal that the metastases arrange themselves into definite class groups. The best form of treatment in these cases depends on the exact type of metastases. The axilla offers a more difficult problem in thorough irradiation than does the breast on account of the proximity to the brachial plexus and the large axillary vessels. More diffuse radiation is scattered throughout the axillary space by the use of the Pack radon wires, the platinum radon needles and the long element needles than by the use of bare tubes and gold seeds. More irradiation is required to obtain disappearance of axillary disease than supraclavicular disease. In only one type of supraclavicular metastasis is the use of bare tubes or gold seeds indicated. The clavicle will withstand one routine exposure of eight high voltage roentgen treatments. The use of chordotomy in cases of carcinomatous invasion of the brachial plexus is urged. Bulky metastasis to the parasternal site is ordinarily dissipated by the routine use of one radium pack of 15,000 millicurie hours and one high voltage roentgen treatment. The literature on this subject of metastasis into the osseous system implies the uselessness of attempting treatment. Well planned irradiation, together with the use of proper supportive apparatus, however, not only gives great relief from pain but occasionally has given months of useful life to patients who were bedridden with paralysis of the legs from pressure on the spinal cord. Properly planned irradiation as a rule will give improvement in function and symptoms in cases of metastasis into the pelvic bone.

Gold-Filtered Radon Transfixion Tubes in Treatment of Mammary Cancer.—Pack emphasizes the fact that the breast containing a cancer and the adjacent regions of lymphatic drainage must receive diffuse rather than focal interstitial irradiation. It occurred to him that the substitution of linear for point sources of radiation would afford a more accurate placement and a more diffuse distribution of interstitial irradiation. Accordingly, he collected radon in long capillary gold tubes of 0.3 mm. filter, the length being determined in each instance by the size of the breast. These hollow gold wires are sealed at their extremities. Waxed silk threads are attached on caps to these capillary tubes to permit their withdrawal after the proper time has elapsed. The flexibility and small caliber of these gold capillary tubes facilitate their introduction in the same manner as the implantation of gold radon seeds. They are placed within the trocar needles with the attached threads projecting from the hilts. The tumor, breast, axilla or tissue to be irradiated is transfixed by the needle; as the needle is withdrawn the gold capillary tube is left in place, having been extruded from the needle point by gentle pressure against the wire obturator in the trocar. The radon transfixion tubes are introduced in gridiron fashion so as to transfix the tumor and surrounding tissue in three planes, horizontally, vertically and anteroposteriorly. The tubes are of sufficient length to extend completely through and beyond the palpable margins of the tumor in order to irradiate its environment. The ends of the wires are well beneath the skin, which is perforated only by the attached silk threads. From twelve to sixteen radon tubes suffice to irradiate the average breast and the tumor which it contains. The four or six tubes inserted anteroposteriorly are short to correspond with the thickness of the breast at the site of the tumor. The transverse tubes, from four to six of which are used, are slightly shorter than the width of the breast. The tubes for vertical implantation are longer in pendulous breasts. In an average case the length of the gold radon tubes might be as follows: anteroposteriorly, 4 cm.; transversely, 6 cm.; vertically, 8 cm. In the axilla, they are inserted fanwise in order to afford diffuse and accurate irradiation of the axillary contents. The scheme for distribution of these radon tubes in the axilla calls for three tubes, each 10 cm. in length, or six tubes 6 cm. in length. They are introduced from below upward or downward from the subclavicular region, care being taken to avoid the axillary vessels and brachial plexus at the apex of the axilla. The author has used this method of irradiation in the treatment of fifteen patients with mammary cancer since August, 1930. Of these, seven had inoperable and eight had operable carcinomas of the breast. The results have been gratifying, considering the large size of the tumors selected for this treatment.

Pneumonias Associated with Aspiration of Oils in Lungs.—Pierson calls attention to the fact that fats and oils often reach the alveoli of the lungs when they are administered to children either orally or through the nasopharynx. They collect in large masses in the lungs and are associated with chronic pneumonias and fibrosis. The widespread use of oils in pediatrics offers a large potential source for this condition. The presence of fatty material in the lungs produces an interesting roentgen picture without pathognomonic signs.

Osteopoikilosis.—According to Wilcox, osteopoikilosis, or osteopathia condensans disseminata, is a condition which is relatively rare in the medical literature. It is characterized by a disseminated condensation of the bones of the skeleton without clinical symptoms. All the bones have been shown to be involved except the bones of the skull. The multiple areas of increased density vary from 2 mm. to 2 cm. in diameter and are found in the spongiosa of the epiphyses and the metaphyses of the bones. They are not found in the midportion of the diaphyses of the long bones. The condition has been observed in both males and females, and, as it occurs without symptoms, it is found by accident during a roentgen examination for some other condition. The etiology is unknown, but it is evident that there are more or less uniform disturbances in the proliferation and ossification of bone-forming cartilage during the period of development. In a search of the literature, the author was able to find seventeen cases of osteopoikilosis; to these he adds the reports of two cases that he observed.

American Journal of Syphilis, St. Louis

16: 145-288 (April) 1932

Conduct of Spirochaeta Pallida in Tissue Explantations. F. Földvari, Budapest, Hungary.—p. 145.
Life History of Treponema Pallidum: Critical Review of Literature. N. R. Ingraham, Jr., Philadelphia.—p. 155.
*Syphilitic Nephrosis. M. Bodansky and S. S. Templin, Galveston, Texas.—p. 191.
Colloidal Mercury Sulphide in Treatment of Syphilis. W. Gennerich, Kiel, Germany.—p. 198.
*Studies in Serology of Syphilis: IX. General Consideration of Precipitation Tests for Syphilis. H. Eagle, Baltimore.—p. 218.
*Eagle Flocculation Test in Serum Diagnosis of Syphilis. M. Bodansky, Galveston, Texas, with assistance of Bess Reitzel.—p. 232.
Use of Plasma in Precipitation Tests for Syphilis. K. L. Burdon, St. Louis.—p. 237.

Syphilitic Nephrosis.—Bodansky and Templin describe a case of syphilitic nephrosis in which the edema was promptly relieved by a high meat diet. The serum proteins before treatment were equivalent to an osmotic pressure of 10.94 mm. of mercury, calculated by using Govaerts' constants. Within five days on the high meat diet, it rose to 13.58 mm. Although this is approximately 26 per cent below the average normal (18.4 mm.), the change was sufficient to cause most of the edema to disappear. A serum protein content equivalent to an oncotic pressure of 21.3 mm. was obtained in a subsequent analysis. By this time the edema had completely disappeared. The last analysis recorded showed the serum proteins to have an oncotic pressure of 27.32 mm. of mercury, a normal value. During the eight months' period of observation, the basal metabolism increased from minus 38 to minus 12 per cent. This occurred without the use of thyroid.

Serodiagnosis of Syphilis.—A consideration of the mechanism of the precipitation tests for syphilis leads Eagle to the enumeration of a group of factors common to all the precipitation tests and largely determining their sensitivity and specificity. It is suggested that the precipitation technic may be improved by (1) the use of theoretically and empirically determined optimal values of these factors, (2) the discovery of new sensitizers to be used as adjuncts to cholesterol, and (3) a more extensive use of the centrifuge as an aid to aggregation.

Eagle Flocculation Test.—In a series of 3,072 consecutive cases, Bodansky found that the Eagle flocculation test possesses a high degree of accuracy and reliability. The error is probably less than 2 per cent. He believes that because of its unusual simplicity and the well defined character of the reaction, the Eagle test is likely to become a most valuable diagnostic procedure.

Archives of Internal Medicine, Chicago

49: 541-712 (April) 1932

Biologic Value, Iodine Content, Histologic, Structural and Clinical Picture of Goiter. A. Jordi, Bern, Switzerland.—p. 541.
*Granulopenia (Granulocytopenia), with Especial Reference to Classification and Benign Types. G. M. Piersol and E. Steinfield, Philadelphia.—p. 578.
*Hodgkin's Disease with Cavity Formation in Lung: Report of Case. J. S. Bouslog and W. W. Wasson, Denver.—p. 589.
*Hemangiectatic Hypertrophy and Congenital Phlebarteriectasis, with Particular Reference to Diagnostic Importance of Peripheral Vascular Phenomena. H. L. Blumgart and A. C. Ernstene, Boston.—p. 599.
*The Man-Environment Unit and Peptic Ulcer. G. Draper and Grace Allen Touraine, New York.—p. 616.
*Effect of Ligation of Parotid Duct on Carbohydrate Metabolism of Totally Depancreatized Dogs. L. M. Zimmerman and S. Soskin, Chicago.—p. 663.
Subacute Bacterial Endocarditis Due to Staphylococcus Albus: Report of Case. B. Stich, New York.—p. 666.
*Chorea Gravidarum: Statistical Study of Nine Hundred and Fifty-One Collected Cases, Eight Hundred and Forty-Six from the Literature and One Hundred and Five Previously Unreported. P. Willson and A. A. Preece, Washington, D. C.—p. 671.
*Association of Infectious Asthma and Arthritis from Point of View of Bacterial Allergy. J. Harkavy and S. Hebald, New York.—p. 698.

Granulopenia.—Piersol and Steinfield state that, so far as one may apply observations made on laboratory animals and on patients suffering from benign forms of granulopenia to the more severe fatal forms, it seems possible that the mechanism is similar in all. Varying degrees of severity may depend on the duration or the potency of the harmful agent and the constitutional make-up of the individual. Sudden removal of older leukocytes is followed by attempts to replace these by younger forms in a more or less orderly fashion in mild cases. In severe cases there is apparently an abeyance of granulo-

poiesis, or there may be disorderly distribution with a throwing out of still more immature forms. In the latter instances, it would appear that the hypothetic chemotactic factor is active while the maturation factor is absent. Clinically, the authors have seen both of these reactions following arsphenamine therapy; in one, there was produced a granulopenic picture; in the other, a blood picture indistinguishable from myeloblastic leukemia. In regard to their own experiments, they can only state that a long-continued granulopenia could not be induced in healthy rabbits by the use of a small group of common bacteria in the form of suspension filtrates or inactivated supernatant fluids. The assumption of a probable altered state of reactivity (from an immunologic point of view) as a factor in these disturbances was not borne out by these results. This, of course, does not dispose of the obscure conditions conveyed by the terms idiosyncrasy or constitutional susceptibility. The positive results in the production of short periods of granulopenia with intravenous injections of peptone and other substances followed by the characteristic influx of young forms on recovery are of interest mainly in their resemblance to milder forms of granulopenia.

Hodgkin's Disease.—Bouslog and Wasson report a case of lymphogranuloma of the mediastinal type, which in its later stages closely resembled tuberculosis. It was exceptional in that there developed a true cavity in the lung, which also proved to be lymphogranulomatous when the case came to necropsy. The authors have been unable to find a similar case reported in the literature.

Hemangiectatic Hypertrophy and Congenital Phlebarteriectasis.—A case of hemangiectatic hypertrophy and congenital phlebarteriectasis was studied clinically by Blumgart and Ernstene. Criteria for the diagnosis of the condition were established. The left arm was conspicuously larger than the right; the blood flow through the left upper extremity was considerably increased, but the volume output of blood per minute from the heart and the velocity of blood flow through the lungs were normal. The velocity of blood flow in the left arm was far greater than that in the right arm. The so-called diagnostic signs of arteriovenous aneurysm are not diagnostic of arteriovenous aneurysm but are rather to be regarded as signs of free arteriovenous communication; the exact nature and site of the communication must be determined by further study. The following signs may be regarded as manifestations of free artery to vein communication; they do not denote whether the artery and vein communicate by direct anastomosis or by intermediate vascular plexuses: (1) increase in pulse pressure in the affected part due to elevation in the systolic and reduction in the diastolic blood pressure; (2) lowering of the general diastolic arterial pressure of the body; (3) increase in venous pressure in the affected veins and their tributaries without the general venous pressure of the body necessarily being affected; (4) capillary pulsation; (5) raised ventricular rate; (6) normal or increased output of blood from the heart; (7) normal or increased size of the heart; (8) abnormally high oxygen content of the venous blood of the affected part; (9) elevation in the temperature of the skin of the region in which the abnormal communication is situated, and (10) thrills and murmurs over the site of the abnormal communication and over the arteries leading to the lesion. If after an artery is occluded the ventricular rate slows, the general diastolic blood pressure of the body rises, a lessening of venous engorgement of the affected part occurs, and the peripheral murmurs and thrills disappear, the abnormal artery to vein leakage lies in the segment of artery compressed or in its peripheral continuation. The signs of multiple free communications characteristic of hemangiectatic hypertrophy and congenital phlebarteriectasis that distinguish this condition from the direct anastomosis of arteriovenous aneurysm are as follows: 1. There are usually several or numerous dilated arteries leading to the site of phlebarteriectasis; there is generally but one dilated arterial trunk leading to an arteriovenous aneurysm. 2. Systolic venous pulsations are transmitted away from the periphery in congenital phlebarteriectasis; they are transmitted toward the periphery as well as centrally in arteriovenous aneurysm. 3. Increased growth of the region in which the abnormal communications are situated favors the diagnosis of phlebarteriectasis rather than arteriovenous aneurysm.

The Man-Environment Unit and Peptic Ulcer.—According to Draper and Touraine, the ulcer race families seem to produce a preponderance of males, and these males are of the long thin type. Furthermore, not only in their morphology, but also in their psychologic make-up, they display a well marked emphasis on the feminine component of the androgynous mosaic. Fear is clearly an important factor in the digestive disturbance of the gastric ulcer race. It would seem that the peptic ulcer race was composed of persons of definite constitutional type. These people possess qualities of soma and psyche which can be easily recognized. When the healthy balance of the "man-environment unit" is disturbed, symptoms in the domain of the sympathetic nervous system and gastro-intestinal tract develop. The "man-environment unit" disturbance can often be corrected permanently by the use of appropriate psychotherapeutic methods. Analytic psychology at present seems to offer the best attitude of approach.

Ligation of Parotid Duct.—Zimmerman and Soskin report that ligation of the parotid ducts does not exert a demonstrable effect on the carbohydrate metabolism of totally depancreatized dogs. The factor that is responsible for the increased dextrose tolerance following ligation of the parotid ducts in normal animals, therefore, probably does not have a direct insulin-like action but rather operates through the pancreas as an activating or stimulating agent.

Chorea Gravidarum.—Willson and Preece present a statistical study of chorea gravidarum based on an analysis of the available data of 951 choreic pregnancies occurring in 797 persons, much the largest collection of cases thus far assembled. One case was personally observed by them, and the remainder were collected from the literature or through the medium of a questionnaire sent to more than 500 American obstetricians. Their study led them to the definite conclusion that the chorea occurring during pregnancy is identically the same disease as Sydenham's chorea in adolescents, modified slightly, in certain respects, by its association with pregnancy. The prognosis is much less grave than has heretofore been believed and seems to be improving, as the mortality rate of 12.7 per cent since 1900 is half of that obtaining prior to 1880. The best treatment for the chorea theoretically and from the standpoint of results obtained consists of "rest, seclusion, careful feeding and gentle discipline" (Wall and Andrews). Nerve sedatives and morphine may be used, but sparingly and with great discretion. In mild cases there is undoubtedly no reason for therapeutic abortion. In severe cases the statistical evidence fails to show better results with intervention than without; in fact, the reverse is true. If resorted to at all, intervention should be by the induction of premature labor or abortion and, except in rare instances, not by immediate operative delivery, as the mortality in these procedures is about 50 per cent. Its most likely indication would seem to be in the case in which the patient is getting progressively worse, despite treatment, but before fever, leukocytosis, and so on, give evidence of active and generalized infection; under the latter circumstances, it apparently does nothing but hasten the fatal outcome.

Asthma and Arthritis.—In a study of bronchial asthma due to hypersensitiveness to infection, Harkavy and Hebald observed nine cases in which attacks of arthritis developed. The arthritis was migratory, affecting various small and large joints, and was accompanied by redness, swelling and pain on motion, but practically no fever. The duration of arthritis varied from two to four years, whereas that of asthma was from six to fifty years. In five of the patients, foci of infection in sinuses and lungs constituted the only etiologic factors of the asthma and joint manifestations. In four, besides infection there was a coexistent atopic hypersensitiveness to substances such as ragweed and goose feathers. Simple elimination of these atopens had no influence on either the asthma or the arthritis. Evacuation of pus from antrums, treatment of ethmoids and the consequent recession of the pulmonary focus caused complete subsidence of the arthritis in eight of the nine cases, while the asthmatic seizures diminished in frequency and severity in each instance. A consideration of recent accumulating evidence of bacterial allergy accompanying infectious conditions such as scarlet fever, rheumatic fever and

its arthritis, and tuberculosis, leads the authors to the conclusion that the allergic state is part of the immunologic mechanism accompanying infection. In asthma induced by a chronic focus of infection, bacterial allergy is an admittedly accepted mechanism. Coexistent arthritis due to the same focus is in all probability an expression of a similar reaction in allergic persons in whom the lungs are the primary and the joints the secondary shock tissues.

Archives of Ophthalmology, Chicago

7: 499-660 (April) 1932

*Detachment of Retina and Its Surgical Therapy: Experimental Study. L. L. Mayer, Chicago.—p. 499.
*Angiomatosis Retinae with Cerebellar Cyst (Lindau's Disease). W. S. Atkinson, Watertown, N. Y.—p. 510.
Fundamentals of Dynamic Retinoscopy. J. I. Pascal, Boston.—p. 515.
Pathology of Melanosis and Benign Melanomas of Ciliary Body. B. Alexander, Montreal, Canada.—p. 521.
Circulation of Aqueous: I. Rate of Flow. J. S. Friedenwald and H. F. Pierce, Baltimore.—p. 538.
Problem of Late Afternoon Lighting. C. E. Ferree and G. Rand, Baltimore.—p. 558.
Size and Shape of Ocular Images: I. Methods of Determination and Physiologic Significance. A. Ames, Jr., G. H. Gliddon and K. N. Ogle, Hanover, N. H.—p. 576.
Chemical Constitution of Sclera. A. C. Krause, Baltimore.—p. 598.

Detachment of Retina.—Mayer describes experiments on rabbits from which it would seem rational to make the deduction that the retinal tear or hole is not the entire factor in maintaining a detached retina. Although reattachment occurs when the cautery is used, there is marked destruction of tissue in the vicinity of the operative wound. Permanent experimental detachment of the retina has not been produced, and further progress in a study of this kind must await such a procedure. Methods that do not cause this extensive destruction but at the same time produce an exudate that seals the retina to the choroid would seem to be those of preference.

Lindau's Disease.—Atkinson reports a case of Lindau's disease in a man, aged 32. In the sex and age of the patient, this case corresponded with the others reported. An enormous vein with the angiomatous tumor mass in the periphery, white patches of exudate in the retina and an enlarged artery with aneurysms presented a rather typical picture of angiomatosis retinae, often referred to as von Hippel's disease. This, together with a cerebellar cyst and angiomatous areas in the cyst wall, seems sufficient to classify the case as Lindau's disease. That no other members of the patient's family were found to have the disease does not preclude this diagnosis. This adds a second case of Lindau's disease in which the histologic diagnosis of the cerebellar lesion has been verified during the life of the patient.

Archives of Otolaryngology, Chicago

15: 503-670 (April) 1932

*Electrosurgery and the Otolaryngologist, Including Gradual Extirpation of Tonsils by Electrocoagulation and Diathermocryptectomy. F. B. Balmer, Chicago.—p. 503.
Relationship Between Status Lymphaticus, Thymus and Suprarenal Glands. E. H. Campbell, Philadelphia.—p. 517.
*Nasal Polypi Associated with Unsuspected Malignant Growth: Report of Case. N. E. Lacy, Kansas City, Mo.—p. 530.
*Laryngeal Vertigo: Its Relation to Cataplexy. J. G. Wilson, Chicago.—p. 534.
*Specific Prophylaxis of Pneumococcus and Streptococcus Meningitis: II. Vaccine Prophylaxis. J. A. Kolmer and K. W. Amano, Philadelphia.—p. 547.
Tuning Fork Exciter and Sources of Error in Tests of Hearing. R. M. Moose, San Bernardino, Calif.—p. 557.
*Ultimate Fate of Bone When Transplanted into Nose for Purpose of Correcting a Deformity. W. W. Carter, New York.—p. 563.
Clinical Importance of Mastoid Antrum. G. E. Tremble, Montreal, Canada.—p. 574.
Apparent Effects of Cerebral Tumor on Auditory Acuity: Report of Case. L. J. Lawson, Evanston, Ill.—p. 583.
*Pathologic Changes in Ear in Niemann-Pick's Disease. J. G. Druss, New York.—p. 592.
*Pathologic Changes in Tonsils: Their Relation to Usual Indications for Tonsillectomy. P. S. Rhoads, Chicago.—p. 599.
Chloroma: Its Relation to Otolaryngology. R. Levy and H. I. Laff, Denver.—p. 610.
Progress in Otolaryngology: Summary of Bibliographic Material Available in Field of Otolaryngology: Tumors of Nose and Throat. G. B. New and W. Kirch, Rochester, Minn.—p. 623.

Electrosurgery.—Balmer considers that electrosurgery is a valuable and indispensable aid to classic surgery. A thorough knowledge of the various electrical currents and their application is absolutely prerequisite for the proper and safe employment of electrosurgery. The therapeutic action of the various currents is very selective as well as being attended with an abundance of precision and flexibility. In certain fields of surgery, electrosurgery has replaced the scalpel, and it bids fair to continue to do so. Electrocoagulation does not replace surgery in the removal of the tonsils; however, it is better suited in certain selected cases. It is the method *par excellence* for the removal of postoperative tonsillar tissue and adhesions, lingual hypertrophy and varix and for the extirpation of the tonsils in the presence of certain diseases. There is at present no ideal method for the removal of the tonsils under all circumstances. The combination of surgery and electrosurgery is a means of approaching this ideal. The status of the orthodox surgical tonsillectomy is more secure since the advent of electrosurgery, owing to the fact that the postoperative difficulties that are so frequent can usually be remedied with this newer procedure with a minimum of inconvenience, morbidity and mortality to the patient. Nothing short of total removal of the tonsils should be considered when they are diseased and their removal is indicated, with the exception that diathermocryptectomy may be considered under special circumstances when a more conservative procedure is imperative. Electrocoagulation has many contraindications and limitations. The surgeon should be equipped to use the method best suited to the conditions at hand and should not be limited by lack of knowledge, ability or equipment, or by prejudice. The noticeable improvement following two or three treatments with electrocoagulation is probably due to the sterilizing effect of the current on the diseased tonsil tissue. The coagulated tissue remaining in situ probably acts similarly to an autogenous vaccine, causing a defense reaction to ensue.

Nasal Polypi with Malignant Growth.—Lacy calls attention to the fact that nasal polypi are associated with malignant growths frequently enough to oblige the rhinologist to consider this possibility in every case of nasal polypi that he encounters. The author reports a case which bears out the theory that a nasal polypus is not transformed into a malignant tumor but is a result of a primary malignant process in the mucous membrane. It is particularly important that the tissue surrounding the attachment of the polypus should be carefully examined as well as that all the polypi be removed. The examination of one of a large number of polypi that have been removed does not constitute a pathologic examination. The amount of radium required cannot be determined without a pathologist's report of the tissue removed.

Laryngeal Vertigo.—According to Wilson, laryngeal vertigo is a sequence of abnormal motor responses produced reflexly from the larynx and its associated respiratory mechanism, by closure of the larynx under conditions not yet understood. The essential phenomena are a sudden fall to the ground and a speedy and complete recovery, with or without loss of consciousness. Frequently superadded clinical phenomena are observed, traceable to a more prolonged closure of the larynx with increase of intrapulmonary pressure. Neither those cases in which consciousness is retained nor those in which syncope occurs are to be regarded as distinct but as due to the same laryngeal closure and reflex. Reasons are given why laryngeal vertigo and cataplexy are to be regarded as related clinical entities presenting at times characteristics that differentiate the one from the other. The author suggests reflex inhibition of tonus from laryngeal closure and arrest of respiration.

Specific Prophylaxis of Pneumococcus and Streptococcus Meningitis.—Kolmer and Amano state that it is possible to raise the resistance of rabbits to meningeal infection with virulent pneumococci and streptococci by preliminary immunization with autogenous vaccines. They observed especially encouraging results among rabbits vaccinated with type I pneumococcus and later inoculated intratympanally with the same strain. With types II and III pneumococci and Streptococcus hemolyticus vaccines, the effects of immunization were less apparent when the animals were later inoculated intracisternally with virulent cultures producing fulminating meningitis among the controls. The intracutaneous injection of pneumococcus and streptococcus vaccines appeared to produce a higher degree of immunity than subcutaneous injections. The

oral administration of pneumococcus vaccines sometimes resulted in producing a high degree of resistance to meningeal infection. The authors recommend that, when time permits, careful bacteriologic examination of the secretions be made in chronic sinus and otitic infections, especially ethmoiditis, and that in pneumococcus and streptococcus infections autogenous vaccines be administered preliminary to operative procedures to raise immunologic resistance when meningitis is feared as a possible complication.

Ultimate Fate of Bone Transplants.—Carter draws the following conclusions from his many years of clinical experience in the use of autogenous bone transplants: 1. Bone may be successfully transplanted from one part of the body to another. The rib, with its outer layer of periosteum, is available and is best suited for supplying this tissue. The gap remaining after the removal of a segment is filled with new bone two months after the operation. 2. If aseptic conditions are preserved and the transplant is left in contact with live bone, it will establish osseous connection with this bone and will continue to live and grow, its growth being regulated by the functional demands of the part. 3. Bone, properly transplanted, is not absorbed. 4. Should infection occur and this be eliminated by proper measures, without the loss of the transplant, at least a portion of the latter is certain to become necrotic. The necrotic area, however, will be filled in with new bone by a process of creeping substitution brought about by the activity of the specific osteogenic cells remaining in the live portion of the transplant and in the live bone with which it is in close contact. 5. Close inspection of some of the author's cases of many years' standing shows that, in the correction of nasal deformities, autogenous implants of bone and cartilage may be relied on to secure permanent results.

Niemann-Pick's Disease.—The pathologic changes in the ear in a case of Niemann-Pick's disease are described by Druss. Large foam cells were found in the submucosa of the tympanum and antrum, in the bone marrow and perivascular spaces of the temporal bone, and about the nerve trunks in the internal auditory meatus and in the purulent exudate of the middle ear. Reasons are given for the belief that these cells are of the lipoid histocytosis type. Degenerative changes were also found in the ganglion cells of the seventh and eighth nerves.

Pathologic Changes in Tonsils.—Rhoads believes that in many cases simple inspection reveals sufficient evidence for the removal of tonsils. In most cases, however, it is of little importance as compared with the evidence adduced by a careful history, ordinary laboratory examinations and a painstaking physical examination. Team work by the internist and the otolaryngologist is required. If the general examination reveals a systemic disease that is usually associated with focal infection, and other more obvious foci are not discovered, the tonsils should be regarded as probable sources of infection regardless of their external appearance.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

13: 197-253 (April) 1932

Studies in Application of Heat to Female Pelvis. G. D. Royston, F. H. Ewerhardt and M. A. Roblee, St. Louis.—p. 197.
Aids for the Hard of Hearing. H. Newhart, Minneapolis.—p. 202.
Diathermy as Aid in Treatment of Gonorrheal Endocervicitis. A. G. Fleischman, Des Moines, Iowa.—p. 207.
Recent Advances in Heliotherapy as Applied in Pulmonary Diseases. A. M. Forster, Colorado Springs, Colo.—p. 214.
Physical Therapy and Traumatic Surgery. J. E. M. Thomson, Lincoln, Neb.—p. 216.
Electrothermic Treatment of Accessible Malignant Growths. W. H. Schmidt, Philadelphia.—p. 219.
Plea for Better Understanding of Colon Mechanics. F. H. Morse, Boston.—p. 225.
Physical Therapy Office Measures Helpful in Iritis. E. G. Linn, Des Moines, Iowa.—p. 230.

Colorado Medicine, Denver

29: 145-184 (April) 1932

Cardiac Asthma. L. E. Viko, Salt Lake City.—p. 149.
Present Trends in Tuberculosis. C. E. Harris, Woodmen.—p. 155.
Geriatrics. C. O. Giese, Colorado Springs.—p. 159.
Head Injuries. W. D. Abbott, Des Moines, Iowa.—p. 163.
Respective Indications of Cholecystostomy and Cholecystectomy. Aime Paul Heineck, Chicago.—p. 166.

Delaware State Medical Journal, Wilmington

4: 77-98 (April) 1932

Hemorrhage in Early Pregnancy. J. M. H. Rowland, Baltimore.—p. 77.
New Method of Performing the Radical Cesarean Operation. W. Wertenbaker, Wilmington.—p. 83.
Social Insurance. E. H. Ochsner, Chicago.—p. 87.

Florida Medical Association Journal, Jacksonville

18: 451-492 (April) 1932

Cardiac Diseases and Their Relation to Occupation. T. Z. Cason, Jacksonville.—p. 459.
Partial Statistical Study of Three Hundred and Sixty-Five Cases of Appendicitis. J. S. Turberville, Century.—p. 462.
Otologic Immunity. C. J. Heinberg, Pensacola.—p. 468.
Estimated Average of at Least Twenty Per Cent Hookworm Disease in Ninety-Eight Southern Schools. C. W. Stiles, Winter Park, and B. J. Collins, Washington, D. C.—p. 471.

Indiana State Medical Assn. Journal, Fort Wayne

25: 157-204 (April) 1932

Distribution of Physicians in Indiana. T. B. Rice, Indianapolis.—p. 157.
*Aspiration of Joints. E. B. Mumford, Indianapolis.—p. 162.
Kidney Function Tests. A. F. Weyerbacher, Indianapolis.—p. 165.
Embryology, Congenital Anomalies, Anatomy and Histology of Kidneys. W. N. Wishard, Jr., Indianapolis.—p. 168.
Classification and Etiology of Nephritis. G. S. Bond, Indianapolis.—p. 171.
Modern Theory of Urinary Secretion. H. O. Mertz, Indianapolis.—p. 172.

Aspiration of Joints.—Mumford considers that aspiration of a joint is a safe surgical procedure when done under careful aseptic conditions. It is therefore a line of treatment that can be done by the general practitioner. Effusions into joints that form rapidly after trauma even of a trivial type are bloody in character and should be aspirated at an early date. Blood is absorbed slowly from joints. The precipitated fibrin leads through irritation to marked and serious changes within the joint cavity, requiring major operations for relief. Many of the late joint changes that give rise to considerable impairment can be prevented by early aspiration of the original bloody fluid. Since the traumatic joint is usually first seen by the general practitioner, he should recognize the importance of early aspiration.

Iowa State Medical Society Journal, Des Moines

22: 205-242 (May) 1932

A Surgical Clinic. C. J. Rowan, Iowa City.—p. 205.
Nasal and Oral Hemorrhage Associated with Purpura Hemorrhagica. Clare V. Lawton, Grinnell.—p. 210.
The Rising Mortality from Appendicitis. A. Kolodny, Sioux City.—p. 212.
Cancer and Hydrochloric Acid: Preliminary Report. C. R. Harken, Osceola.—p. 215.
*Enterostomy as Life-Saving Measure. W. W. Bowen, Fort Dodge.—p. 216.
Claude Bernard's Theory and Reversible Coagulation Reactions of Proteins. A. W. Swensen, Waverly.—p. 219.
Subacute Combined Degeneration of Spinal Cord Affecting Twins. F. P. Moersch, Rochester, and T. J. Pfeffer, DeWitt.—p. 221.
Spontaneous Subarachnoid Hemorrhage in Childhood. J. E. Dyson, Des Moines.—p. 223.

Enterostomy as Life-Saving Measure.—According to Bowen, enterostomy has a great field of usefulness. He uses it in all suppurating conditions in the abdomen when there is actual or threatened peritonitis; in all cases of ruptured duodenal ulcer, ruptured gallbladder, septic appendix, or pelvic infection, when he also finds evidence of peritonitis, distended intestine, or an inflamed, angry-looking intestine; also he uses enterostomy as a preliminary procedure when there is a malignant tumor to be removed later. An enterostomy does a good many things that nothing else will do. First, it rapidly drains out any toxins that may be in the intestine. Second, it allows fluids and gases in the intestine to escape and so prevents distention or reduces any distention that may be present. Third, it allows the intestine distal to the enterostomy to rest, so that, if peritonitis has begun, the rest permits recovery if it is not too far advanced, and, if peritonitis has not begun, there is little chance for it to start. Fourth, it allows the immediate giving of water. There is an exit for gas and for fluids and usually the patients do not vomit from taking water. Fifth, it allows the immediate pouring of liquids into the intestine at the place where absorption is most active; namely, the jejunum.

Journal of Immunology, Baltimore

22: 245-314 (April) 1932

Electric Charge of Bacterial Antigens. L. Olitzki, Jerusalem, Syria, Turkey.—p. 251.
Antigenic Analysis of Variants of B. Paradysenteriae and Serologic Relation of One Variant to B. Morgani. G. M. Mackenzie and Louise N. Batt, Cooperstown, N. Y.—p. 257.
*Variations in Encephalitogenic Power of Vaccinia Virus. R. Thompson and L. Buchbinder, New York.—p. 267.
*Studies of Diseases of Lymphoid and Myeloid Tissues: IV. Skin Reactions to Human and Avian Tuberculin. F. Parker, Jr., H. Jackson, Jr., G. F. Hugh and T. D. Spies, Boston.—p. 277.
Bacterial Endotoxin: Search for a Specific Intracellular Toxin in S. Pullorum. J. H. Hanks and L. F. Rettger, New Haven, Conn.—p. 283.

Variations in Encephalitogenic Power of Vaccina Virus.—Thompson and Buchbinder describe experiments on animals in which they demonstrated that the presence or absence of the encephalitogenic property in various strains of vaccinia virus cannot be ascribed to heterogenic origin, since derivants of the same parent strain differ in this respect. Variations in the character of the skin lesions produced by neurotropic and dermotropic viruses are apparently associated with the presence or absence of the ability to produce encephalitis. The encephalitogenic strains are not obviously contaminated with herpes virus, since recovery from neurovaccinial infection affords as little immunity to herpes virus as does recovery from dermovaccinial infection. The power of neurotropic strains to produce encephalitis is not referable to contamination with the virus of poliomyelitis, since the latter virus does not cause a nonencephalitogenic vaccinia strain to become encephalitogenic for rabbits. Evidence is present which indicates that the neurotropic vaccinia strains are not contaminated by some unknown virus capable of producing encephalitis alone or when aided by a vaccinial infection. The encephalitis producing power of certain vaccinia strains is probably a property of the vaccinia virus itself. The authors suggest that the presence or absence of this property may be due to a process similar to the process of dissociation in bacterial cultures.

Studies of Diseases of Lymphoid and Myeloid Tissues.—Tuberculin tests in which use was made of both human and avian tuberculin were carried out by Parker and his associates on patients with Hodgkin's disease, malignant lymphoma, leukemia, pernicious anemia and malignant tumors. Similar tests were done on tuberculous and normal individuals. Fewer positive reactions were obtained in the patients with the diseases of the lymphoid and myeloid tissues and with malignant disease as compared with the normal persons and the tuberculous patients. More positive reactions to avian tuberculin than to human were found except in the normal group.

Journal of Industrial Hygiene, Boston

14: 113-158 (April) 1932

Contribution to Methods Used for Rapid Determination of Dust in Air. C. Naeslund, Uppsala, Sweden.—p. 113.
Procedure for Establishing Optimum Air Conditions for Light and Heavy Work. G. D. Arnaoutow and E. W. Weller, Moscow, Russia.—p. 117.
Cadmium Poisoning: I. History of Cadmium Poisoning and Uses of Cadmium. L. Prodan, Boston.—p. 132.

Journal of Urology, Baltimore

27: 371-506 (April) 1932

*Pathologic Changes in Pyelitis of Children Interpreted on Basis of Experimental Lesions. R. L. J. Kennedy, Rochester, Minn.—p. 371.
*Surgical Treatment of Nephritis. I. Simons, New York.—p. 399.
Renal Anomalies: Case Reports. J. A. H. Magoun, Toledo, Ohio.—p. 435.
*Horseshoe Kidney: Report of Five Cases. J. A. Lazarus, New York.—p. 471.
Congenital Urinary Obstructions in Male Children: Reports of Cases Presenting Unusual Anomalies. W. A. Frontz, Baltimore.—p. 489.
*Simple Technic for Prostatic Resection. R. E. Tyvand and H. C. Bumpus, Jr., Rochester, Minn.—p. 503.
*Diverticuleve. H. W. Howard, Portland, Ore.—p. 505.

Pathologic Changes in Pyelitis of Children.—Reports of four cases of pyelitis in which death occurred unusually early after the infection are presented by Kennedy, together with histologic studies. All were instances of infection of the urinary tract by colon bacilli solely, and without accompanying obstruction. There was an acute, widespread, suppurative process involving the renal and peripelvic tissues. In these cases of several days' to three weeks' duration there was definite pyelitis and peripelvic inflammation in every instance, and abscesses and diffuse infiltration of the parenchyma. These lesions showed a tendency to heal promptly. It is doubtful whether it will be possible to obtain specimens at necropsy in cases of pyelitis of shorter duration than these; therefore it is unlikely that examination of material from human beings will help in determination of the mode of infection. Hematogenous and ascending lesions, with and without obstruction, were produced experimentally and studied in detail. The hematogenous lesions were found to occur first in the cortex and medulla, and the ascending lesions were found to occur first in the pelvis and peripelvic tissues. In both types of infection, the process spread rapidly to the entire kidney, so that, after from forty-eight to seventy-two hours, it may be impossible to tell how the lesions were produced. Obstruction did not favor localization in the kidney of organisms injected intravenously. The process of healing begins early, as it does in the human being, and proceeds rapidly, with ultimate formation of fibrous tissue. The author emphasizes that, in every instance both in human beings and in experimental animals in which early lesions occurred, the pelvis participated in the process.

Surgical Treatment of Nephritis.—Simons considers that surgery in acute and chronic Bright's disease is indicated in selected cases in which one or more of the following symptoms or signs are in the foreground: (1) severe renal pain; (2) massive renal hemorrhage; (3) the oliguria-anuria-uremia complex, and (4) the preceding associated with anasarca. Careful complete urologic study is necessary in order to eliminate such conditions as hemorrhage with tuberculous kidney, calculous anuria, neoplasm of the kidney or its pelvis and other conditions which are not true manifestations of Bright's disease. The author includes several other conditions in his discussion which, while not bona fide Bright's disease, are of hematogenous pathogenesis though pyogenic; they are analogous and are best considered in this group. Most of the cases that are to be considered as surgical fall into the groups known as (1) acute diffuse glomerulonephritis, (2) chronic diffuse glomerulonephritis, (3) the kidney of pregnancy and eclampsia, (4) necrotic nephroses (metallic poisons, and so on), (5) lipoid nephroses, (6) embolic purulent nephritis, and (7) focal and unilateral nephritis. Semisurgical procedures, such as lavage of the renal pelves, have a place. The operations of renal decapsulation, nephropexy, nephrotomy and nephrectomy are indicated in selected cases.

Horseshoe Kidney.—According to Lazarus, horseshoe kidney is not a rare anomaly, occurring in about 0.1 per cent of normal persons. Horseshoe kidneys are relatively more prone to pathologic lesions than are normally formed kidneys. There are no symptoms characteristic of horseshoe kidney. When symptoms occur, they are due to some associated pathologic lesion. Most cases of horseshoe kidney have been diagnosed at the time of operation or at postmortem examination. A careful study of a good flat kidney roentgenogram will usually suffice to lead to the suspicion of this anomaly by showing the proximity of the renal silhouette to the vertebral column, by the obliteration of the psoas margins in part or in their entirety, and by the failure to visualize one or the other of the renal poles. Pyelography clinches the diagnosis of horseshoe kidney by showing the bizarre pelves and calices usually pointing anteriorly and approximated to the midline and shortening of ureters. The best treatment for an extensive suppurative lesion, tumor or tuberculosis involving one half of a horseshoe kidney is heminephrectomy. All other diseases involving horseshoe kidneys are treated in exactly the same manner as are similar diseases in normally formed kidneys. The diagnosis of horseshoe kidney prior to operation will greatly facilitate operative procedures on such kidneys.

Simple Technic for Prostatic Resection.—Tyvand and Bumpus describe an instrument for transurethral resection of the prostate, which is simple in construction, easy of application and in their hands has proved efficient in a considerable series of cases. It consists of a Braasch cystoscope, number 28 French, in which a fenestra has been made large enough to engage tissue to the amount of approximately 1 Gm. The instrument is open at the distal end, and the entire neck of the bladder can be observed before the obstructing tissue is engaged in the fenestra and hence the operation is carried on under full vision.

After the tissue to be excised is engaged, the needle electrode is thrust into the base of the portion of the gland to be removed, entering at exactly the place where the circumference of the tubular knife will cut. The current is allowed to flow for a few seconds, as the object is not to coagulate the engaged tissue completely but simply to seal the vessels entering it. The electrode is then removed and the tubular knife is used to excise the tissue. The procedure can be repeated as often as is needed to remove the obstructing tissue. The instrument is equipped with a catheterizing guide, which closes the fenestra and converts it into a direct cystoscope, so that at the end of the operation the entire field of procedure may be examined and if any bleeding points persist these may be coagulated with an electrode passed through the catheter guide.

Diverticuleve.—The diverticuleve described by Howard consists of a modified Kelly uterine tenaculum, which in the removal of bladder diverticula provides the mechanism of the left or inside hand and, occupying little space, permits free access to the site of operation. To the lower jaw of the instrument has been added a metal plaque of the size and shape of the palmar surface of the distal phalanx of the index finger. It is given a curve in conformity with that of the tenaculum and its surface is roughened. When the jaws of the instrument are applied to the neck of the sac, it can be lifted on the appendage and held so while the superjacent bladder wall is separated from it by sponge or dissector. The completion of removal of the sac merely consists of a repetition of the maneuver, an amount somewhat in excess of the size of the appendage being separable with each change of the instrument. In order to speed up removal of the larger sacs, it has been found advantageous to have an enlarged instrument—one with somewhat broader jaws and broader and longer appendage. The author has removed diverticula of varying sizes from five patients with the aid of this instrument. From his experience he believes that all diverticula of the bladder can be removed without the necessity of going outside the bladder wall or of packing the sac.

Maine Medical Journal, Portland

23: 67-92 (April) 1932

Treatment of Cancer in Woman by Radium. A. P. Leighton, Jr., Portland.—p. 73.
Progress in Spinal Anesthesia. W. E. Tobie, Portland.—p. 78.
*Use of Maggots in Treatment of Wounds. E. S. Hall, Portland.—p. 80.
Oscillometry in Study of Circulatory Disturbances of Lower Extremities. J. R. Hamel, Portland.—p. 85.
State Bureau of Health: Division of Communicable Diseases. Margaret Herrick, Augusta.—p. 87.

Use of Maggots in Treatment of Wounds.—Hall treats the ordinary case of osteomyelitis in the following manner: The part is washed thoroughly with sterile water, the bone is exposed and all the diseased material is removed, the marrow cavity being widely opened. The wound is then packed with sterile gauze and left for from twenty-four to forty-eight hours or until all bleeding has stopped. Maggots are then placed into the wound and the wound is covered with a wire cage. It is necessary to have this cage fit well, for if it does not the maggots are bound to escape and the patient frequently objects, mainly because they tickle when they walk on normal skin. The cage is made by sewing fine brass screen to strips of half inch sponge rubber, which are made to fit the edges of the wound exactly. The cage is applied to the wound by folding adhesive tape so that there is a sticky side to the edge of the wound and a sticky side for the rubber to be attached to. After the cage is in place, it is strapped down along its edges with other strips of adhesive tape so that it is firmly applied and there is no opportunity for the maggots to escape. After the cage is applied, an ordinary electric light is placed over it in order that the maggots may be kept warm and also to drive them deeper into the wound. Maggots always seek the shade and hence get as far from the light as possible. The maggots remain in the wound for five days and are then washed out with sterile water and a new lot inserted. A number of difficulties have arisen in treating cases. Among them has been the putting of too many maggots into a wound, with the result that in their search for food they appeared to irritate normal tissue. In all the author's cases in which this has happened, the condition has been corrected by removing some of the maggots. In some adults, particularly those of nervous disposition, it was found best to give them a rest period of from twenty-four to forty-eight hours between each application of maggots. By so doing, many patients continued with the treatment who otherwise would have refused treatment with maggots. Another difficulty that was overcome rather easily was in the treatment of osteomyelitis of the distal phalanx of a finger. Because of the small amount of dead material available, it was found that only a few maggots could be used and that at the end of a few hours they would have eaten all the material available. Consequently, a new batch of maggots was inserted each morning and by so doing a normal finger resulted. Many other conditions were treated with maggots with exceptionally good results, including two cases of varicose ulcers, one case of carbuncle, one case of an infected hand (with no bone involvement), two bad bed sores, and one case of a large sloughing cancer of the skin. Rapid cures resulted in most of the cases except the cancer, and that was helped materially, in that the offensive odor was eliminated by the maggots.

New England Journal of Medicine, Boston

206: 827-874 (April 21) 1932

*Meckel's Diverticulum in Children: Clinical and Pathologic Study: Report of Thirty-Two Cases. W. W. Hudson, Jr., and L. H. Koplik, Boston.—p. 827.
*Cancer of Cervix in Nulliparous Women: Report of Three Cases. L. E. Phaneuf, Boston.—p. 840.
Biliary Drainage as Diagnostic Agent. S. A. Wilkinson, Boston.—p. 843.
Progress in Dermatology. H. P. Towle and J. L. Grund, Boston.—p. 845.

Meckel's Diverticulum in Children.—Hudson and Koplik report thirty-two cases of Meckel's diverticulum. Twenty-six children presented symptoms referable to the diverticulum and of these seventeen (63 per cent) showed hemorrhage from the bowel, with or without other signs. In seven cases, hemorrhage was the main feature. These are summarized. When blood is present in the stool, it may or may not be mixed with the stool and may be bright red or changed. The high proportion (52 per cent) of diverticula showing mucosa similar to that of the stomach does not necessarily indicate that ulceration is the cause of bleeding. When present in the authors' series, ulcers were acute and did not resemble the usual peptic ulcer. The association of hemorrhage from the intestine with other acute abdominal symptoms should suggest the diagnosis of Meckel's diverticulum. Examination of the terminal ileum should be performed at laparotomy.

Cancer of Cervix.—Phaneuf reports three cases of cancer of the cervix in nulliparous women. The patients were seen during an interval of five months. Their ages were 25 years, 28 years and 34 years, respectively. In two the disease was arrested by roentgen and radium treatment, although it is too early to say what the future holds for them. In the third, the condition progressed despite treatment and the patient is now in the last stages of the disease. The author emphasizes the fact that semiannual examinations and prophylactic treatment of the precancerous lesion might have prevented the appearance of an extensive cancer of the cervix in these women.

New Orleans Medical and Surgical Journal

84: 741-840 (April) 1932

Toxoid Immunization Campaign. W. H. Robin, New Orleans.—p. 741.
Newer Conception of Diphtheria Immunization. R. A. Strong, New Orleans.—p. 743.
Economic Phase of Diphtheria Immunization in New Orleans. J. Signorelli, New Orleans.—p. 747.
Treatment of Certain Acute Abdominal Conditions. W. H. Parsons, Vicksburg, Miss.—p. 749.
Induced Paralysis of Diaphragm. J. W. Barksdale, Jackson, Miss., and S. F. Strain, Sanatorium, Miss.—p. 753.
Roentgen-Ray Treatment of Inflammatory and Nonmalignant Conditions. E. B. van Ness, Jackson, Miss.—p. 757.
Roentgen Ray in Diagnosis of Malignancy. E. C. Samuel and E. R. Bowie, New Orleans.—p. 760.
Blood Transfusion. S. E. Field, Centreville, Miss.—p. 764.
Use of Iodine in Goiter. E. R. Nobles, Rosedale, Miss.—p. 769.
Pyelonephritis Occurring in Pregnancy. W. A. Reed, New Orleans.—p. 775.
Industrial Eye Injuries. J. B. Stanford, Memphis, Tenn.—p. 782.
Early Syphilis: Its Diagnosis and Treatment. R. L. Gordon, New Orleans.—p. 788.
Disability Following Fractures. K. Rand, Alexander, La.—p. 791.
Louisiana Criminal Code Relative to Functioning of State Lunacy Commission. W. P. Butler, Shreveport, La.—p. 795.

Pennsylvania Medical Journal, Harrisburg

35: 437-532 (April) 1932

Reminiscences of Forty Years in Ophthalmology. W. C. Posey, Philadelphia.—p. 437.
Methods That Have Proved Successful in Treatment of Some of Common and Obstinate Diseases of Skin. C. J. White, Boston.—p. 443.
Analysis of Forty Thymus Glands from Infants, with Especial Reference to Hassall's Corpuscles. G. A. Clark, Scranton.—p. 449.
Proctologic Symptomatology and Diagnosis. M. S. Kleckner, Allentown.—p. 452.
Use of Laboratory Methods in Cardiovascular Diagnosis. C. C. Wolferth, Philadelphia.—p. 456.

Physical Therapeutics, Elmira, N. Y.

50: 81-120 (March) 1932

Electrosurgery: A Few Applications in Surgical Urology. W. S. Pugh, New York.—p. 81.
Practical Review of Direct Continuous Current. J. E. G. Waddington, Detroit.—p. 92.
Radiant Heat and Light. E. L. Libbert, Lawrenceburg, Ind.—p. 97.

Public Health Reports, Washington, D. C.

47: 931-986 (April 22) 1932

*Experimental Transmission of Endemic Typhus Fever of United States by Rat Flea Ceratophyllus Fasciatus. R. E. Dyer, W. G. Workman, L. F. Badger and A. Rumreich.—p. 931.
Formation of Arsenoxide from Arsphenamines in Living Animal and in Test-Tube Oxidations. S. M. Rosenthal.—p. 933.

Experimental Transmission of Endemic Typhus Fever.—In their first studies on the part played by rat fleas in the transmission of endemic typhus from rat to rat or from rat to man, Dyer and his associates incriminated two species of rat fleas, namely, Xenopsylla cheopis and Ceratophyllus fasciatus. The infectibility of Xenopsylla cheopis with endemic typhus was shown and the probable mechanism by which the infection is transmitted to man was elucidated in a large measure in their more recent studies. In their present study the authors describe an experiment in which they demonstrated that the virus of endemic typhus may be transmitted from rat to rat by means of the rat flea Ceratophyllus fasciatus.

Radiology, St. Paul

18: 713-878 (April) 1932

Physical Foundation of Grenz Ray Therapy. O. Glasser, Cleveland.—p. 713.
*Treatment of Superficial Fungus Infections with Long Wavelength Roentgen Rays (Grenz Rays): Further Observations. M. Dorne and C. White, Chicago.—p. 727.
*Grenz Ray Therapy. A. Reisner, Frankfort-on-Main, Germany.—p. 733.
Roentgen Therapy in Bone Metastasis of Carcinoma. K. W. Stenstrom and L. G. Ericksen, Minneapolis.—p. 741.
*Roentgen-Ray Treatment of Keloidal and Hypertrophic Scars. B. H. Sherman, Hollywood, Calif.—p. 754.
*Roentgen-Ray Treatment of Gonorrheal Complications in Males. F. Liberson, New York.—p. 758.
Apparent Therapeutic Effect of Roentgen Ray on Clinical Course of Acute Mastoiditis: Preliminary Report. R. Schillinger, Brooklyn.—p. 763.
*Radiotherapy of Pituitary Tumors. W. Harris and H. Selinsky, New York.—p. 777.
Roentgen-Ray Study of Passage of Different Foodstuffs Through Small Intestine of Man. L. J. Menville, New Orleans.—p. 783.
Present Status of Problem of Measurement of Roentgen-Ray Intensity and Quality. J. W. M. DuMond and A. Hoyt, Pasadena, Calif.—p. 787.
Roentgen Evidence of Osseus Manifestations in Sickle-Cell (Drepanocytic) Anemia and in Mediterranean (Erythroblastic) Anemia. L. T. LeWald, New York.—p. 792.
Present Status of Appendiceal Diagnosis. R. A. Payne, Portland, Ore.—p. 799.
Heredity of Cancer. N. Dobrovolskaïa-Zavadskaïa, Paris, France.—p. 805.

Superficial Fungus Infections.—Dorne and White add an experience of twenty-two more cases to a previous report of thirty patients who had dermatoses which were considered to be of superficial fungus infection and who were treated with infraroentgen rays used in fractional doses. With such dosage, infections due to yeastlike fungi responded quite uniformly to therapy, while those of hyphomycetic origin showed little, if any, improvement.

Infraroentgen Therapy.—Reisner states that from a theoretical standpoint there are two points of advantage in the treatment of skin diseases by roentgen rays of long wavelength. One is the almost complete absorption in the upper layers of the skin, which has been proved by absorption measurements; the other is the protection of the deeper layers of the tissue. In addition, there is also the wide margin of safety between the therapeutically effective dose and the injuring dose, which decreases with increasing wavelength. In a series of cases of eczema and neurodermatosis in which the lesions were symmetrical, the author carried out the treatment by exposing one side to infraroentgen rays and the other side to ordinary roentgen rays. While in the overwhelming majority there was an even regression, sometimes there was a preponderance of the effect of infraroentgen rays. From a study of the world literature and from his own experience with infraroentgen rays, the author sums up the present situation in this field as follows: 1. The basis for successful infraroentgen therapy is exact dosage. 2. For the treatment of superficial skin diseases, infraroentgen therapy offers a valuable addition to the therapeutic armamentarium. 3. While the therapeutic effect is approximately the same as that of ordinary roentgen rays, sometimes it seems slightly superior. 4. The advantage lies in the fact that the deeper layers of tissue are well protected and that the therapeutic dose can apparently be administered without danger of immediate or delayed injuries. 5. In the treatment of local disease, the value of general body exposures to infraroentgen rays is a greatly debated problem. 6. A final judgment as to the effect of infraroentgen rays on internal diseases cannot be passed at the present, but further investigations in a large number of cases are necessary and seem to be worth the effort. 7. Injuries following infraroentgen therapy can apparently be avoided if very soft rays are used and if the smallest dose required for the therapeutic result is administered.

Treatment of Keloidal and Hypertrophic Scars.—Sherman believes that one should be guarded in the prognosis in every case of keloid or scar, be it ever so small or recent, being particularly cautious as regards the syphilitic or the tuberculous type and of erosions on the face, hard lesions, and lesions in the dark-skinned races. Roentgen treatment should not be pushed to the point of producing telangiectasis; in these instances it would be better to use a less destructive wavelength. In the formation of scars there is a wide diversity of reactions. In some extensive injuries, whether lacerations, bruises or burns, there are bound to be mutilating scars with contractions, while in others with the same extensive injury the deformity is surprisingly light. As a general rule, given the amount of surface involved together with depth of tissue involved, one can make a fairly accurate determination of the amount of scar tissue to be expected. Probably the most important item in the treatment of these conditions is caution: caution in the application of whatever mode of treatment is used; fearlessness in calling on the plastic surgeon when he is needed, for dividing responsibility may help in cases in which failure impends, and especially caution in the prognosis, as it may save embarrassment later.

Gonorrheal Complications in Males.—Liberson studied the effects of high voltage roentgen therapy in the treatment of various complications of gonorrhea in 119 males over a period of six and one half years, with especial consideration for recurrences and for comparison with untreated control groups. In the order of efficacy, roentgen therapy appears uniformly effective in the painful heel due to periosteal spur; it has a limited field of usefulness in the treatment of refractory gonorrheal joint complications, especially for the relief of pain, but in gonorrheal epididymitis, adenitis and urethritis the results were not significant.

Roentgen Therapy of Pituitary Tumors.—Harris and Selinsky subjected thirteen persons with pituitary tumor to roentgen therapy and observed them at trimonthly intervals for varying lengths of time. Ten of the thirteen were females; three, males. Endocrine dysfunction consisted of manifestations of hypopituitarism in eight cases and of hyperpituitarism in four cases. Seven of the thirteen patients were distinctly benefited by the treatment and one showed temporary improvement. Amelioration of headache and improvement in vision were most frequently noted. In no case was there a complete disappearance of symptoms. Failure to respond to treatment is highly suggestive of a cystic tumor (craniopharyngeal pouch cyst). The authors believe that patients in whom diagnosis of pituitary tumor has been made should receive therapeutic trial with roentgen therapy before they are subjected to surgical intervention.

Rhode Island Medical Journal, Providence

15: 57-76 (April) 1932

Use of Indwelling Ureteral Catheter: Clinical Study. E. Stone, Providence.—p. 57.
Psychiatric Aspects of Medical Disease. H. O. Colomb, Pineville, La.—p. 62.

South Carolina Medical Assn. Journal, Greenville

28: 76-121 (April) 1932

Etiology of Pellagra. E. E. Epting, Anderson.—p. 88.
Sarcoid Associated with Tuberculosis of Larynx: Report of Case. J. R. Allison and P. V. Mikell, Columbia.—p. 89.
Lower Urinary Tract Obstruction in Infants and Children. M. F. Campbell, New York.—p. 96.

Southern Surgeon, Atlanta, Ga.

1: 1-88 (April) 1932

In Memoriam. G. W. Quillian, Atlanta, Ga.—p. 1.
Diagnosis and Management of Brain Injuries. C. E. Dowman, Atlanta, Ga.—p. 5.
The Dramatic Abdomen. J. B. Deaver, Philadelphia.—p. 11.
*Differential Diagnosis and Management of Senile Prostate. H. H. Young, Baltimore.—p. 16.
*Fourth Epoch in Treatment of Cancer of Breast: Use of Radium at Time of Operation Followed by Roentgen-Ray Therapy. J. T. Moore, Houston, Texas.—p. 28.
*Activated and Apathetic Hyperthyroidism: Their Importance in Cases of Heart Failure. F. H. Lahey, Boston.—p. 36.
*Tumors of Colon. J. F. Erdmann, New York.—p. 39.
Appendix as Focus of Infection. H. A. Royster, Raleigh, N. C.—p. 48.
Wright Method of Treating Chronic Ulcers of Leg. H. R. Shands, Jackson, Miss.—p. 51.
Therapeutic Paravertebral Alcoholic Block: Observations of Its Effects Following Its Use in Angina, Asthma and Raynaud's Disease. F. G. DuBose, Selma, Ala.—p. 57.
*Transplantation of Ureters. R. C. Coffey, Portland, Ore.—p. 64.
Roentgenographic Delineation of Urogenital Tract. J. F. McCarthy and J. S. Ritter, New York.—p. 70.
Ununited Fractures in Long Bones. W. C. Campbell, Memphis, Tenn.—p. 74.

Diagnosis and Management of Senile Prostate.—Young is convinced that in prostatectomy the perineal route is not only technically the most satisfactory but also the safest. It is accompanied by a mortality much less than can be obtained through the suprapubic route, whether the operation is done in one or two stages. The author presents an analysis of 197 consecutive cases of perineal prostatectomy without a fatality. This operation permits the surgeon to see the prostate, to examine minutely any region suspected of being malignant, to carry out operation under visual inspection, and to provide for complete hemostasis and good dependent drainage. These attributes make the perineal route unquestionably the method of choice, and are responsible for its greatly lower mortality.

Fourth Epoch in Treatment of Cancer of Breast.—Moore reports a plan of radium irradiation, to be used at the time of and in conjunction with surgery in the treatment of operable carcinoma of the breast. In addition to a radical operation, these patients should be given the advantage of carefully planned radium irradiation at the time of operation. Such treatment is far more efficacious in dealing with cancer of the breast than is the scalpel alone. The use of well planned roentgen treatments probably should follow after two to three months, being governed by the condition of the patient. The patients must be carefully watched for any evidence of a growth at any point so that irradiation may be given promptly, and their general health must be kept constantly in mind.

Activated and Apathetic Hyperthyroidism.—Lahey states that there is no pathologic evidence that heart damage results from prolonged hyperthyroidism. Even though a patient may have long suffered from hyperthyroidism, if relieved of it his heart is as sound as before. There are no laboratory experiments to prove that the prolonged feeding of thyroid extract damages the heart. Still further evidence is that cardiac decompensation occurs only in persons of middle or late life, who have had years in which to develop heart disease. All these factors lead to the belief that cardiac decompensation with hyperthyroidism is a result of a hyperthyroidism superimposed on an already damaged heart. Hyperthyroidism produces tachycardia, a definite extra load for an already damaged heart. Then cardiac irregularity interrupts the rest periods, throwing an additional burden on the heart. When auricular fibrillation is established, intermittent failure and finally chronic and permanent failure follow. In every case of apathetic hyperthyroidism there is grave danger of an unexpected death following operation. No matter how favorable conditions appear at operation, if the author is sure that the patient suffers from apathetic hyperthyroidism he divides the operation into two stages. In the first stage he does a right hemithyroidectomy and then sends the patient home for six weeks, to return at the end of that time for the removal of the other lobe. He feels strongly that this is the only safe course. He stresses, too, the necessity of carefully investigating patients with chronic heart failure for underlying hyperthyroidism. This type of hyperthyroidism is atypical and often obscured by the superimposed cardiac decompensation. Once recognized, however, restoration of cardiac function through subtotal thyroidectomy, and operation with relatively low mortality rate in such serious cases, may be expected.

Tumors of Colon.—Erdmann reports 107 cases of tumors of the colon coming under his operative care during the past three years. He is satisfied that the classifiation of these tumors as to region should not include the rectosigmoid as taking in the true rectum. His object in this classification is twofold as, primarily, the operation is or should be a perineal one and, secondly, the results of the perineal operation in the true rectal or rectal and anal are far ahead of those in the so-called rectosigmoid inclusion. Granted that a perineal anus has for years been abhorred by surgeons, from what the author has observed in patients on whom he has performed the perineal operation, he himself would prefer a perineal operation with its low mortality, its postoperative functions and its ease of attention to that of sigmoidostomy. When the growth involves the rectosigmoid junction, the term itself implies an invasion of the lower sigmoid and the proximal rectum. On growths in this region it is most difficult to perform any operation but the most extensive, involving permanent colostomy. The operation also carries a relatively high mortality as compared to operations on rectal neoplasms. In general, the author is accepting more patients today whom years ago he would have refused for anything but colostomy.

Transplantation of Ureters.—Coffey calls attention to the fact that transplantation of the ureters is the only place in the domain of surgery in which one single principle controls the entire situation. Under all conditions in which nature must deliver fluid through a duct from an organ in which the pressure must be low and regular to a muscular reservoir in which the pressure is higher and is irregular, the end is accomplished by the mechanism of the valve. The only way that nature has made a valve for such a purpose at any point is by running the duct beneath the mucosa of the receiving organ for a distance before it enters into the lumen. This fundamental proposition forms the background of any successful technic for transplantation of the ureters into the intestine. Two other important considerations must be remembered: 1. When a ureter is transplanted, the swelling in the wall, at least in certain instances, temporarily retards or completely blocks the flow of urine from that kidney. If both ureters have been transplanted without the provision for the free passage of urine, the patient will often die from uremia. Sometimes this swelling does not obstruct the ureter, but it is generally conceded that bilateral transplantation of ureters without this provision is dangerous. 2. The operation must be done in an essentially septic field. Therefore, every effort to sterilize the field and produce an aseptic operation should be made. Tube technic, which the author describes in detail, should be used as a routine procedure except for special indications.

Wisconsin Medical Journal, Madison

31: 222-287 (April) 1932

Looking Ahead in Tuberculosis. R. H. Stiehm, Milwaukee.—p. 229.
Acute Fractures of Spinal Vertebrae Without Cord Injury: Report of One Hundred Cases. H. E. Conwell, Birmingham, Ala.—p. 230.
Asthma. H. T. Schlegel, Wausau.—p. 239.
Multiple Sensitiveness in Hay Fever and Asthma. H. P. Greeley, Madison.—p. 242.
Criminal Confessions Under Narcosis. W. F. Lorenz, Madison.—p. 245.
Neurosyphilis: Incidence in Admissions to Wisconsin State Penal and Correctional Institutions During Year July 1, 1930, to June 30, 1931. S. A. McCormick, Madison.—p. 251.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Bristol Medico-Chirurgical Journal, London

49: 1-114 (Spring) 1932

Some Observations on Relationship Between Structure and Function. J. R. Charles.—p. 1.
Human Improvability. C. S. Myers.—p. 31.
Trigeminal Neuralgia. H. H. Carleton.—p. 47.
*Some Observations on Relative Efficacy of Various Treatments of Pernicious Anemia. G. L. Ormerod.—p. 61.

Treatment of Pernicious Anemia.—Ormerod states that up to the present time by far the best results in the treatment of pernicious anemia have been achieved by the use of hog's stomach. By the regular use of this it may be said that pernicious anemia is a definitely curable disease. Whereas the use of liver merely supplies the patients with the ready-made substance that is essential for the formation of the red cells, the use of stomach tissue supplies them with that which is wanted to enable them to make their own red blood cell formative material. The remissions that take place after the use of hog's stomach are of the same nature as those caused by liver but occur more rapidly. The addition of hydrochloric acid is much more rarely needed when stomach is used then when liver is the treatment. Few deaths have been recorded in those taking the treatment with stomach extract, and in nearly every case it was found that the extract was not being taken regularly. Previous blood transfusions appear to make no difference in the result. Several patients who have failed to respond to liver in adequate amounts have immediately improved on starting to take hog's stomach, either raw or as a desiccated preparation. If it can only doubtfully be said that absence of improvement with liver indicates that the disease is not pernicious anemia, it can certainly be said so of hog's stomach.

British Journal of Experimental Pathology, London

13: 109-188 (April) 1932

*Mobilization and Excretion of Calcium Following Overdosage with Irradiated Ergosterol. N. B. Taylor and C. B. Weld.—p. 109.
Displacement Method for Estimating Cell Volume in Blood. C. E. Jenkins.—p. 127.
Observations on Inorganic Sulphate Content of Blood in Eclampsia. D. F. Anderson and S. L. Tompsett.—p. 130.
Effect of Intravenous Injection of Glycine on Serum Calcium. N. Morris, J. B. Rennie and S. Morris.—p. 132.
Attempt to Demonstrate Residual Virus in Monkeys Which Had Recovered from Yellow Fever. E. Hindle.—p. 135.
*Action of Acetylcholine on Gastric Secretion in Man. J. F. Wilkinson.—p. 141.
Basal Oxygen Consumption of Goitrous and Nongoitrous Rats. A. W. Spence.—p. 149.
Effect of Vitamin Deficiency on Structure of Thyroid and Thymus Glands. A. W. Spence.—p. 157.
Demonstration of Herpetic Antibody in Human Serums by Complement Fixation, and Correlation Between Its Presence and Infection with Herpes Virus. R. T. Brain.—p. 166.
Spontaneous Fluctuations in Reticulocyte Count in Pigeon's Blood. Lucy Wills.—p. 172.
Technic of Exposing Chorio-Allantoic Membrane of Chick Embryo for Experimental Purposes. Daphne Goulston and J. C. Mottram.—p. 175.
*Serum Calcium Content in Eclampsia. D. F. Anderson.—p. 182.

Excretion of Calcium.—Taylor and Weld report that large doses of viosterol when administered to dogs in negative calcium balance cause hypercalcemia. The total calcium excretion is also increased. The experiments indicate that the excess calcium in the serum is derived from body tissues. Hypercalcemia was produced by the intravenous administration of viosterol to cats from which the gastro-intestinal tract had been removed. Cats poisoned with lead and given large doses of ergosterol after the lead administration had been discontinued showed a striking increase in the quantity of the metal excreted in the urine. Large quantities of calcium were excreted with the lead. In normal dogs, calcium is excreted chiefly by the intestine; only small quantities appear in the urine. Under the influence of large doses of viosterol, the route for the excretion of calcium is turned from the intestine to the kidney. Evidence is submitted in support of the conclusion that the reduction in fecal calcium that follows ergosterol administration in this dosage is due to depression of the intestinal excretion rather than, as has been supposed, to increased absorption. No correlation between the calcium content of the diet and the quantity of calcium in the feces could be found. Animals during starvation excreted as much calcium in the feces as those on diets containing moderate quantities of calcium. The amount of calcium excreted by animals on a normal diet was just as great as when, during later periods, they received excess calcium in the form of calcium chloride. The authors conclude that the hypercalcemia following large doses of viosterol is due to the withdrawal of calcium from the skeleton. The calcium mobilized from the bones accumulates in the serum. A certain level of serum calcium having been reached, an increase in the urinary calcium follows. Ergosterol in the amounts that produce hypercalcemia does not increase absorption of calcium from the intestine.

Acetylcholine.—Wilkinson investigated the stimulating influence of acetylcholine on gastric secretion in normal and abnormal subjects. He found that its effects on the gastric secretion in normal and abnormal individuals are uncertain. In the majority of normal cases there is an increased secretion of free hydrochloric acid and total chlorides following injection, but it is much less marked than that produced by histamine. The response increases slightly with the dose of acetylcholine used. A small group of normal subjects failed to display any alteration in secretion. Acetylcholine is not so powerful as histamine and frequently fails to disclose pseudo-achlorhydric conditions. It has rather more marked effects in cases showing hypo-acidity and Raynaud's disease, but there also histamine is more powerful. Atropine readily counteracts or prevents the effects of acetylcholine on the gastric secretory mechanism.

Serum Calcium Content in Eclampsia.—In 82 per cent of forty-four cases of eclampsia investigated by Anderson, the patients showed subnormal serum calcium values—that is, 9 mg. per hundred cubic centimeters and under. The lowering of the serum calcium in such a large percentage of cases is suggestive. With a lessened concentration, as occurs toward the end of pregnancy, any sudden change or demand on the reserves may prove too much for the maternal organism. It is not indicated that lowered calcium concentration is necessarily the etiologic factor in eclampsia but is a sign, just as is the raised serum inorganic sulphur. Calcium deficiency may not be due to an absence of calcium from the body but to the incapacity to utilize the calcium that is present. Symptoms that appear in normal pregnancy, as the result of the increased activity of the organs of internal secretion, may reach a degree that is definitely pathologic in an organism less capable of adaptation to the changing demands of the fetal organism.

British Journal of Radiology, London

5: 289-384 (April) 1932

*Conversion of Chronic into Acute Leukemic Myelosis: Contribution to Study of "Myeloblast" and of Nature of Leukemic Process. A. Piney.—p. 289.
Economy and Quality in Radiology. A. Bouwers.—p. 311.
III. Intensity of Ultraviolet Radiation from Different Parts of Carbon Arc. E. A. Owen and P. Wright.—p. 324.
IV. Spectroscopic Analysis of Ultraviolet Radiation from Different Arcs. E. A. Owen and P. Wright.—p. 330.
Allantoic Membrane of Chick Exposed to Beta Radiation. W. Moppett.—p. 342.
Intracranial Dermoid Cyst. R. A. C. Rigby.—p. 349.
Short Description of Three Interesting Cases. O. L. Rhys.—p. 351.
Roentgen-Ray Analysis of Teeth. J. Thewlis.—p. 353.
Bone Tumors. J. F. Brailsford.—p. 360.
*Periodic Fluctuation of Electric Field of Human Body. W. E. Boyd.—p. 362.
Protective Devices and Tools Used in Radium Department, Royal Berkshire Hospital, Reading. A. O. Forder.—p. 368.

Conversion of Chronic Into Acute Leukemic Myelosis.—According to Piney, it is not known why a case of chronic leukemic myelosis should ultimately become acute. Occasionally the change appears to have followed intense roentgen treatment. In one case described there was good response to roentgen treatment for several years, but ultimately the disease became acute and the patient died in a short time. In another case there was not even transient improvement; roentgen rays were followed almost immediately by a rise of myeloblasts from 16.3 to 84.2 per cent, with death in a few days.

Periodic Fluctuation of Electric Field of Human Body.—According to Boyd, certain of the potentials on the skin of the human body show periodic change of the same periodicity as the electrocardiograph current change. The dis-

tribution of the intensity of these potentials varies, in regard both to the site on the body surface and also to changes in the static electrical condition and environment of the body. It may be modified by the attachment of wires from earth to various sites. The periodic static potential change is due to direct internal communication from the region of the heart or the heart itself.

British Medical Journal, London

1: 693-738 (April 16) 1932

Observations on Control of Silicosis in Industry of South Africa. L. G. Irvine.—p. 693.
Comments on Recent Outbreak of Pneumonia. F. J. Poynton.—p. 698.
*Acute Mastoiditis. J. Lewin.—p. 699.
*Comparative Study of Chest Radiograms and Mantoux Test in Children. Dorothy J. Dow and W. E. Lloyd.—p. 701.
*True Place of Serum in Prophylaxis of Measles. J. I. Collier.—p. 703.
*Osteogenesis Imperfecta: Two Unusual Examples. J. Crooks.—p. 705.

Acute Mastoiditis.—Lewin reports six cases of acute mastoiditis and enumerates the following points, which may be of assistance in establishing a diagnosis of this condition. 1. It is never too early in the course of an acute otitis media to suspect mastoiditis. 2. Persistent pyrexia, in spite of adequate drainage of the middle ear, suggests mastoid involvement, and is itself an indication for operation. 3. Absence of tenderness and signs of inflammation over the mastoid do not negative a diagnosis of mastoiditis. 4. Involvement of important structures, such as the dura mater and the facial nerve, are often the first indications of mastoiditis and must be constantly watched for. 5. To await edema behind the ear and pushing forward of the auricle is to allow the disease to progress unduly. These signs only indicate that the suppuration has come right through to the periosteum. 6. Early diagnosis and operation spell less danger and less possibility of continued suppuration later on. There are many cases sent to the hospital wrongly diagnosed as mastoiditis on the strength of edema and displacement of the auricle, and there are two conditions that commonly give rise to them. The first is inflammation and suppuration in the postauricular lymph node, which is usually secondary to scalp infections or pediculi. The absence of otorrhea or any form of otitis media should give the clue to the correct diagnosis. The second is meatal furuncle. Furuncles occur only in the outer hair-bearing area of the meatus, and the lining here is so closely adherent to the underlying cartilage that the pus is always in the early stages under considerable tension and causes excruciating pain. The infection may pass backward and give rise to edema and tenderness over the mastoid. The presence of a discharge from the ear further suggests the possibility of mastoiditis. There is no real excuse, however, for an error of diagnosis, as a meatal furuncle can always be seen on inspection. Even if its core cannot be distinguished, the swelling and obstruction to the meatus are beyond anything seen in an acute otitis. The intensity of the pain is also characteristic.

Chest Roentgenograms and Mantoux Test in Children.—Dow and Lloyd emphasize the fact that a large number of intrathoracic infiltrations seen in children are nontuberculous. The distribution of the infiltration appears to be much the same in all children, whether they are infected with the tubercle bacillus or free of infection, a little over 50 per cent being in the lower zone, and the remaining 50 per cent being equally distributed in the upper and middle zones of the lung. Upper zone infiltrations are more likely to be tuberculous than lower zone infiltrations. In view of the fact that twenty-two of fifty-five children who were considered to have roentgen evidence of calcified tracheobronchial lymph nodes did not react to tuberculin, it would appear that the roentgenologic criteria in this respect were not sufficiently strict. In every case in which there is any doubt about the presence of calcified lymph nodes, an oblique roentgenogram should be taken, so as to exclude the possibility of mistaking a blood vessel or other structure viewed "end on" as being a calcified nodule. It would appear that, in attempting to localize the lesion in children who are shown to be tuberculous by a positive Mantoux reaction, the chest roentgenogram is not so helpful as might have been supposed. The lesions, if in the lymph nodes, are invisible unless calcified, and the majority of such lesions may be extrathoracic. Further, the authors' experience shows that nontuberculous infiltration and fibrosis are more common than tuberculous, from which they cannot be differentiated with certainty. Therefore, while the chest roentgenogram in children is of great clinical value, it has in this respect these definite limitations, and its interpretation in the "Mantoux-positive" child needs the greatest care.

Serum in Prophylaxis of Measles.—Collier emphasizes the fact that in practice the medical man is usually first called in to see a case of measles on the appearance of the rash. Should the case be seen in the prodromal stage, a diagnosis of measles would be made only on the appearance of Koplik's spots. As serum has no effect when injected after the ninth day of incubation, all cases of measles seen in general practice are too late for serum treatment. From this point of view the serum treatment in hospital cases of measles is more hopeless still. The usual hospital case is one in which the patient has been treated privately for several days and then sent into the hospital because the disease is not taking its usual course and complications are setting in. Of all cases of measles in which the patients are treated in fever hospitals, roughly one fourth are already complicating. It will be seen, therefore, that, leaving out the problem of the contacts who are never brought in for treatment, all measles cases are first seen and diagnosed when it is too late to apply serum treatment. The author believes that the place of convalescent serum in the prophylaxis of measles is to ensure a modified attack, and only in exceptional cases to produce complete protection. The use of serum today is of little practical value in the control of measles epidemics and in influencing the resulting mortality.

Osteogenesis Imperfecta.—According to Crooks, osteogenesis imperfecta, osteitis deformans, and generalized osteitis fibrosa may be grouped together as diseases sharing to some degree the same pathologic basis, related to calcium and phosphorus metabolism and possibly to the activity of the parathyroids. In all three of these disorders there is defective calcification of bone, and liability to fractures; the plasma phosphatase, that enzyme which is responsible for the deposition of calcium from the phosphoric esters of the blood, is high. In two of them, osteogenesis imperfecta and osteitis deformans, otosclerosis may develop. Of two cases of osteogenesis imperfecta reported by the author, the first is of interest because the mother suffers from osteitis deformans, while her only child has osteogenesis imperfecta, and the second affords an illustration of the hereditary tendency in osteogenesis imperfecta.

Indian Medical Gazette, Calcutta

67: 181-240 (April) 1932

Atebrin: Synthetic Drug for Treatment of Malaria. L. E. Napier and B. M. Das Gupta.—p. 181.
Field Experiments with Atebrin and Plasmochin. L. E. Napier, Dorothy Butcher and C. R. Das Gupta.—p. 186.
Behavior of Plasmodia in Mosquito After Treatment of Human Host with Atebrin. C. Strickland and D. N. Roy.—p. 191.
Failure of Toddalia Aculeata in Treatment of Malaria. R. B. B. N. Vyas and B. B. Bhatia.—p. 192.
Berberine and Berberine-Containing Plants in Pharmacology and Therapeutics. R. N. Chopra, B. B. Dikshit and J. S. Chowhan.—p. 194.

Journal of Tropical Medicine and Hygiene, London

35: 97-112 (April 1) 1932

*Note on Tsetse Flies. J. F. Corson.—p. 97.
Etiology of "Egyptian Splenomegaly." R. Girges.—p. 99.

Tsetse Flies.—After feeding for some weeks on infected sheep or goats, an unusually large proportion of a small number of flies of Glossina pallidipes were found by Corson to have infected salivary glands. The pupal period of male flies was found to be usually two days longer than that of female flies. It was found that a tsetse fly in captivity may abstain from feeding for as long as fourteen days without apparent loss of health or activity. Experiment showed that tsetse flies, in bottles, readily bit in complete darkness. Tsetse flies readily attacked and fed on fowls, guinea-fowl and francolins, and the birds allowed them to feed and seemed to take no notice of the flies.

Kenya & East African Medical Journal, Nairobi

8: 331-360 (March) 1932

Influence of Light and Heat on Human Body. J. H. Sequeira.—p. 332.

Lancet, London

1: 815-866 (April 16) 1932

*Rôle of Hemolytic Streptococci in Infective Disease. C. C. Okell.—p. 815.
*Effects of Injury on Brain. C. P. Symonds.—p. 820.
*Vaccinia and the Paschen Body: Infection Experiments with Centrifugalized Virus Filtrates. G. H. Eagles and J. C. G. Ledingham.—p. 823.
Malaria Treated with Atebrin: A New Synthetic Drug: Report of Fifty Cases. R. Green.—p. 826.
Treatment by Marmite of Megalocytic Hyperchromic Anemia Occurring in Idiopathic Steatorrhea (Celiac Disease). Janet M. Vaughan and D. Hunter.—p. 829.

Hemolytic Streptococci in Infective Disease.—According to Okell, the properties of the exotoxin of the hemolytic streptococci which are responsible for the peculiar features of the scarlatinal exanthem and of the Dick test are highly important from the point of view of modern work on the prophylaxis of scarlet fever. One of the most remarkable properties of this toxin is that when it is suitably diluted and introduced into the human skin it produces a local erythematous patch which appears within a few hours, reaches a maximum within twenty-four hours and then rapidly fades away, leaving at times a desquamating area but never signs of more severe tissue damage. The consistency and appearance of this local patch of erythema so closely resemble those of an actual area of rash in a subject with scarlet fever that one readily infers that the mechanism of production in the two cases is identical. If this toxin is injected into susceptible human beings in large doses, for example in quantities upward of a thousand times the dose used in the Dick test, a clinical condition results which resembles a self-limited attack of scarlet fever so closely that it has been described as "the scarlatinal syndrome" or "miniature scarlet fever." The syndrome comes on a few hours after the injection. The patient often vomits, develops fever, a frequent pulse, a furred tongue and a generalized rash which in appearance and distribution is indistinguishable from that of scarlet fever. An interesting symptom recorded by a number of observers is soreness of the throat. As in true scarlet fever the rash avoids the face, and the appearance of circumoral pallor has been recorded. A slight albuminuria is common and there may even be transient hematuria. Recovery even from large doses seems rapid and complete. A case of the scarlatinal syndrome has been recorded in which desquamation followed.

Effects of Injury on Brain.—Among the several varieties of headaches encountered in persons following injuries of the brain, Symonds distinguishes three groups. The first is that complained of by the patient in terms of discomfort rather than pain—a continuous sense of numbness or pressure, aggravated by all kinds of mental stimulus, whether internal (e. g., worry over incapacity) or external (noise, bright light). This is the kind of headache present in psychogenic states but also in certain psychoses (for instance, the toxic group and the depressive) and may be considered as one of the reflections in consciousness of general cerebral incapacity. A second variety, often associated with the first, is equally frequent and of a quite different character. It is complained of as throbbing, piercing or aching, is localized rather than diffuse, occurs in bouts, usually of brief duration, and is aggravated by change of posture and physical effort as well as by mental stimuli. This kind of headache is often referred to the situation of the initial injury and is sometimes associated with superficial tenderness. Its character and relation to postural change and effort indicate dependence on some local physical cause, and this may be found in the shape of loculation in the subarachnoid mesh or ventricular system. A third and relatively uncommon variety of posttraumatic headache is that which appears in bouts of considerable duration and severity, and has the bursting quality and association with vomiting which suggests a hydrocephalic state. A bout of this kind may be provoked by alcoholic excess or by a severe physical effort. The liability may remain for a short time only after the injury or may persist indefinitely. If the lines of clinical distinction between these varieties of headache prove to be valid they will serve as guides to differential treatment. The "psychogenic" type of headache will be amenable only to general measures of cerebral rest, including the removal, when present, of litigation worries. The intermittent, localized variety of headache, related to change of posture, may prove amenable to relief by air injection or in severe cases by operation. The rarer hydrocephalic form invites treatment by repeated lumbar puncture.

Vaccinia and the Paschen Body.—Eagles and Ledingham call attention to the fact that improvements in technical methods of virus research have led to renewed study in recent years of the claim put forward by Paschen so long ago as 1906 that the elementary bodies discovered by him in material from vaccinial lesions might prove to be the actual etiologic agents. By high-speed centrifugation they are able to deplete Berkefeld filtrates of vaccinia virus almost entirely of their virus content and to recover the great bulk of the virus in deposits consisting in the main of Paschen bodies. Such deposits after repeated washings in physiologic solution of sodium chloride retain their potency, while the saline menstruum in which the bodies are suspended has been entirely depleted of virus. In the light of these experiments the present status of the Paschen body is discussed, and the conclusion is reached from all the evidence now available that the cause of vaccinia is the Paschen body.

Medical Journal of Australia, Sydney

1: 425-456 (March 26) 1932

History of Recording Blood Pressure. A. H. Á Court.—p. 425.
Blood Cultures in Work of General Hospital. W. J. Penfold and H. M. Butler.—p. 429.
*Facial Paralysis. P. Pickerill.—p. 433.
Trichomonas Vaginalis. R. F. Matters.—p. 434.
Skin Complications of Varicose Ulcers. L. P. U. Crivelli.—p. 435.
Some Reasons for Failure in Treatment of Hay Fever. D. L. Barlow.—p. 436.
Frame for Treatment of Early Stages of Acute Anterior Poliomyelitis. D. J. Glissan.—p. 437.

Facial Paralysis.—Pickerill discusses the treatment of facial paralysis by temporal and masseter muscle grafts. By this method he has obtained far better results than by any other method. The advantages claimed are (1) that the face as a whole is stabilized to a considerable extent, having two tonic muscles at least on the paralyzed side to oppose those on the normal side, and (2) that the patient is given the power of closing the eye on the paralyzed side. This is absolutely definite, and the serious risk therefore of corneal ulceration and conjunctivitis is eliminated. The improvement in appearance is pronounced. The raising of the lower lid and the consequent hiding of the reddened conjunctiva is of itself a decided advantage, and this is quite independent of muscular contraction. The closure of the eye in these cases, and the retraction of the mouth, are voluntary, but with constant practice the action in time becomes almost automatic. The author has previously described the technic of the operation and he has had no reason to modify it, except that he finds that he is increasingly inclined to favor the use of local anesthesia, because one can thereby not only make use of the patient's cooperation but also, as it were, better match the tension on the sound side. The amount of local anesthetic required is surprisingly small, especially if a pool is injected in the region of the foramen ovale. The author believes, too, that perhaps it is better to undertake the grafting in two stages, the first for the temporal muscle and the second for the masseter, at an interval of some weeks. An interesting physiologic problem crops up in some cases; it is what the author cells "impulse spread." In these cases the voluntary contraction definitely spreads from the grafted muscle to the paralyzed muscle (the fibers of which can be definitely seen to contract) and sometimes to other muscles.

Journal of Oriental Medicine, South Manchuria

16: 11-32 (Feb.) 1932

Experimental Studies on Biliary Cirrhosis of Liver, with Particular Reference to "Net-Necrosis." Shozo Kikuchi.—p. 12.
Syphilis of Lungs: Case. Y. Morikawa.—p. 14.
Presence of Yellowish Brown, Iron-Free Pigments in Lymph Nodes. E. Kitabatake.—p. 15.
Experimental Studies on Occurrence of Colitis, with Particular Reference to Significance of Liver in Mercurial Poisoning. Shozo Kikuchi.—p. 17.
Thymoma of Mediastinum: Case. Takeichi Ischii.—p. 19.
Pathology of Brain and Spinal Cord in Scarlet Fever. S. Masayama.—p. 22.
Hemorrhagic Necrosis of Pancreas: Case. M. Suzuki.—p. 24.
Acute Yellow Atrophy of Liver. T. S. Li.—p. 26.
Effect of Ligation of Common Bile Duct on Cholesterol Metabolism. M. Kameyama.—p. 27.
Application of Hormones in Surgical Diseases. K. Horie.—p. 28.
Toxic Jaundice: Experimental Study. Tadasu Itoh.—p. 29.
Distribution of Parasitic Diseases in Manchuria. K. Hiyeda.—p. 31.
C: N and Vacat O: N Quotients of Urine. H. Kubo.—p. 32.

Archives des Maladies du Cœur, Paris

25: 201-248 (April) 1932

Electrocardiographic Modifications of Isolated Heart in Connection with Variations of Calcium Intake. C. Laubry, J. Walser and L. Deglaude. —p. 201.
Complex Disturbances of Cardiac Mechanism in Severe Case of Typhoid. E. Géraudel and M. Mouquin.—p. 206.
Roentgen and Electrocardiographic Signs of Aneurysms of Intrapericardiac Portion of Ascending Aorta. M. R. Castex, L. L. Ramirez and A. Battro.—p. 222.
*Ventricular Tachycardia in Adams-Stokes Disease Caused by Auriculoventricular Dissociation. E. Coelho.—p. 232.

Ventricular Tachycardia in Adams-Stokes Disease Caused by Auriculoventricular Dissociation.—In a case of Adams-Stokes disease reported by Coelho, in which the patient died in syncopal crisis, the block was complicated by paroxysmal ventricular tachycardia appearing spontaneously and without therapeutic provocation. Electrocardiograms of some of the paroxysms were obtained. The author states that syncope and death in cases of Adams-Stokes disease of this type are due to ventricular tachycardia and the ventricular fibrillation that follows, never to ventricular arrest. Digitalis is absolutely contraindicated in cases of ventricular tachycardia associated with block; in these cases it increases the tendency to the production of auricular fibrillation. Epinephrine, ephedrine or barium chloride should not be injected during syncope produced by this mechanism, as they might cause auricular fibrillation and precipitate death. The appearance of ventricular tachycardia during the course of Adams-Stokes disease is a bad prognostic sign, announcing impending death.

Presse Médicale, Paris

40: 641-692 (April 27) 1932

Anatomicopathologic and Bacteriologic Substratum of Tuberculous Rheumatism. F. Bezançon, M.-P. Weil, J. Delarue and V. Oumansky. —p. 641.
Large Paranephric Lipomyxosarcoma with Abdominopelvic Evolution. P. Brocq and P. Huu-Chi.—p. 644.
Chronic Familial and Infantile Rheumatism: A New Form of Chronic Fibrous Rheumatism. G. Marinesco and G. Allende.—p. 646.
Necessity of Systematic Study of Function of Mucous Glands from Point of View of Physiology, Pathology and Therapy. R. Leriche. —p. 650.
Mucus of the Gallbladder. R. Bauer and A. Chinassi Hakki.—p. 650.
Pleural Adhesions in Artificial Pneumothorax. D. Douady and A. Meyer. —p. 653.
Roentgen Diagnosis of Stenoses of Small Intestine. E. Piot.—p. 656.
Pathogenesis of Chronic Encapsulated Peritonitis. P. Wilmoth, C. Delval and J. Patel.—p. 659.
Ulcerated Duodenal Bulb: Significance and Value of Its Deformations. R. A. Gutmann.—p. 661.
Chronic Form of Periarteritis Nodosa. M. Macaigne and P. Nicaud. —p. 665.
*"Tilted Sacrum" as Cause of Pseudolumbago, Pseudosciatica and Pseudorheumatism of the Vertebrae. J. Gourdon.—p. 669.
Anatomicoclinical Study of Pigmentary Cirrhoses of Liver. M. Villaret, L. Justin-Vesancon and R. Even.—p. 672.
Do Certain Regions of Skin Possess Particular Capacity for Allergic Reaction? L.-M. Pautrier.—p. 674.
Traumatic Subluxation of Cervical Portion of Spinal Column. Ployé. —p. 677.
Rôle of Gastric Mucus in Pathogenesis of Gastric Ulcer. R. Fontaine. —p. 678.
Gastroscopy of Gastric Ulcer. F. Moutier.—p. 681.
Phrenicectomy, Scalenotomy and Extirpation of First Rib. A. Maurer and J. Megnin.—p. 685.
*Intestinal Polyposis. R. Bensaude, P. Hillemand and P. Augier.—p. 687.

"Tilted Sacrum" as Cause of Pseudolumbago and Pseudosciatica.—Gourdon discusses the anatomy, diagnosis, prophylaxis and therapy of the condition which he calls "tilted sacrum," by which he means sacro-iliac disjunction and forward displacement of the sacrum. The development of the condition is favored by a sacrum of the straight fetal type; the more it resembles this type, the greater the tendency of the sacro-iliac articulation to give way. Displacement of the sacrum may result from repeated little traumas, such as a long ride in a car, or a sudden great trauma, such as falling on the feet or the buttocks. In the case of a gradual process, the patient first experiences vague sensations of pain and weakness in the lower part of the back, with difficulty in walking and lifting heavy objects. Sudden movements, dropping on the feet, and so on, cause pain in the sacrolumbar region, finally developing into acute attacks of pain lasting several days, which may be accompanied by functional impotence of the lower extremities. These attacks occur with increasing frequency until the clinical picture corresponds to that of the suddenly dislocated sacrum, with acute shooting pains radiating from one or both sides of the lumbar region, buttocks and thighs. The posture is characteristic: accentuated lumbar lordosis with a maximum curve in the sacrolumbar region, protruding buttocks, ptosis of the abdomen, the thighs and knees slightly flexed. Movements of flexion in front of the trunk are difficult and painful. The patient experiences relief in dorsal decumbence; lateral decumbence is painful. Roentgenography of the pelvis confirms the mechanical origin of the disturbances observed by the patient. The disturbances following displacement of the thigh are almost always confused with lumbago, sciatica or, occasionally, vertebral rheumatism. The latter can be eliminated because of the vertebral localization of the pain, febrile evolution, and so on; concerning the former, the author says that the pain provoked by displacement of the sacrum is never localized in the sciatic nerve or the lumbar plexus. The real cause of pain is the tension exerted on the sacro-iliac ligaments by the tilting of the sacrum. Tilting of the sacrum may be foreseen and prevented. Distinct lumbar lordosis in children of from 9 to 12 is a precursor of dislocation of the sacrum. Such children should be given corrective exercises, wear lower heels, and avoid carrying heavy objects. After confinement, patients should wear a rigid band encircling the pelvis at the level of the sacrum and the pubic symphysis. For professional placement it is advisable to determine roentgenographically the closeness of the sacro-iliac articulations and inflection of the sacrum of persons engaged in carrying heavy burdens. Treatment of tilted sacrum comprises three things: disappearance of the tension of ligaments and muscles, straightening of the sacrum, and contraction of the pelvic symphyses. One cannot act on the sacrum without producing relaxation of the ligaments restraining motion. This is done by keeping patients in horizontal decumbence with elastic extension of the lower extremities and progressive anteroposterior compression of the pelvis. The redressment is fixed by a nonremovable plaster bandage encircling the pelvic girdle with extension to keep the hips straight; this is replaced after four or five months by a removable celluloid one. In cases in which the separation of the sacro-iliac articulations is wide, a graft is applied to the summit of the sacro-iliac articulation and the intervention is completed by suture of the pubic symphysis.

Intestinal Polyposis.—Bensaude and his co-workers distinguish three types of polyposis: (1) essential polyposis, neoplasm of unknown etiology developing on a mucosa of normal appearance; (2) polyposis of parasitic origin, the classic example of which is bilharzic polyposis, and (3) inflammatory polyposis of undetermined origin, which includes all cases in which the polypous process is secondary to an ulcerous condition of the mucosa, of unknown origin. The dominant symptom of essential polyposis is diarrhea. Rectal hemorrhages and tenesmus are other clinical signs, but none of them are characteristic. Polyposis is usually best diagnosed by proctoscopy, but while this is the method of choice, roentgen examination is also of importance in revealing the extent of the polypous process. The authors first slowly administer an enema of an opaque substance that adheres to the mucosa, then evacuate most of it and insufflate air into the intestine, thus securing two types of images. They advise making roentgenograms in many positions to visualize different segments of the intestine. The evolution of essential polyposis is cachectic and fatal. Death usually occurs from six to twelve years after the beginning of the disease. Three factors characterize the evolution of essential polyposis: (1) presence of only a slight degree of anemia, (2) appearance of edema and (3) existence of hippocratic fingers. Cancerous degeneration occurs in a large percentage of cases of polyposis. The association of polyposis and infantilism, previously reported in the literature, is stressed by the authors. They describe three histologically different types of polypi and also describe the microscopic picture in biopsy of polypi that have undergone neoplastic degeneration. The importance of biopsic examination is stressed. They consider the study of polyposis interesting from the theoretical standpoint, as it shows the possible inflammatory or parasitic origin of certain benign tumors, the links which connect the inflammatory polypi to adenomas. In connection with the malignant degeneration of polypi it poses the question of etiology of cancer. Discussing therapy, the authors state that they think all cases of successful medical or surgical

palliative treatment reported concerned the inflammatory type of polyposis. In essential polyposis, destruction of the polypi is the only ideal therapy. In a low or localized process, diathermic electrocoagulation of each polypus can be undertaken. When the process is localized but inaccessible to the proctoscope, resection of the diseased portion of the intestine with or without accompanying diathermic treatment of the lower end of the intestine is advised. Treatment of generalized polyposis is more difficult. Good results with irradiation are rare, exclusion of the colon is difficult, and colectomy is accompanied by high mortality. It is possible to diminish the risk by early intervention, improving the general condition of the patient, clearing the lower part of the rectosigmoid by electrocoagulation, and carrying the opening of the anastomosis to a part of the intestine free of polypi.

Giornale di Clinica Medica, Parma

13: 163-232 (Feb. 29) 1932

*Active Changes of Pulmonary Paravertebral Sounds During Mitral Stenosis. G. Picchini.—p. 163.
Treatment of Pulmonary Suppuration, with Especial Attention to a New Method of Treatment (Intravenous Alcohol Therapy). F. Vannucci.—p. 178.
Marked Eosinophilia of Blood. M. Gavazzeni and L. Beltrametti.—p. 199.
Does the Duct of Wirsung Reestablish Itself After Ligation? O. Amorosi.—p. 212.

Active Changes of Pulmonary Paravertebral Sounds During Mitral Stenosis.—Picchini presents a study of thirty-five patients with mitral stenosis. Normally the left auricle has no influence on the active limitation of paravertebral resonance. When, however, the auricle increases in size, as in mitral stenosis, there is either diminution or disappearance of the left paravertebral resonance in respiration. Plexometric changes are not caused by the variable muscular tension of the region. They are explained by various positions and relations which the auricle has with the surrounding lung in the different positions of the body. During flexion the lung has more latitude for expanding itself posteriorly; the slight displacement of the auricle diminishes the pressure on the posterior section of the lungs, and this favors expansion of the postero-internal part of the lung. There is a decrease of the area of retrocardiac dulness and a possibility of limitation of resonance during respiration. When the atrium is greatly enlarged, flexion of the body does not overcome the pressure which the widely dilated auricle exercises on the parenchyma of the edge of the lung. The author concludes that: 1. Existence of the variable paravertebral resonance during respiration along the complete height of the thorax, but especially at the level of the seventh vertebral apophysis, indicates that the auricle is either not at all or only slightly enlarged. 2. Existence of resonance from the sixth to the eighth vertebral apophysis and extending 5 cm. to the side with or without retrocardiac dulness and their disappearance during flexion of the body indicate a moderate enlargement of the auricle. 3. More extended resonance from the fifth to the eighth interspinous space with or without slight changes on flexion of the body, with persistence or slight diminution of the auricular dulness, indicates great enlargement of the auricle.

Policlinico, Rome

39: 65-140 (Feb. 15) 1932. Surgical Section

*Tamponade of Renal Wounds with Catgut: Experimental Study. N. Cirillo.—p. 65.
*Decapsulation and Renal Denervation. V. Lozzi.—p. 84.
Numerical Variations of Leukocytes and Sedimentation Rate in Cholecystitis, Appendicitis and Adnexitis. M. R. Massimiliano.—p. 104.
*Experimental Biologic Research in Hemostasis, with Particular Attention to Craniocerebral Surgery. G. Pacetto.—p. 112.
Pyelographic Accidents: Emergency Nephrectomy Following Retrograde Pyelography in Calculous Hydronephrosis. S. Ragone.—p. 130.

Tamponade of Renal Wounds with Catgut.—Cirillo has used catgut tampons softened in warm water to influence favorably the healing process in renal wounds and resections in rabbits. Anatomopathologic examination proved that complete cure could be effected whether the pelvis of the kidney was excluded by the operative wound or whether it became part of it. The living tissue broke up the catgut and transformed it into a granular mass, which in turn was absorbed by the leukocytes and their proteolytic ferments. The granulation tissue then replaced the disappearing catgut. Zones of calcification were seldom noted. Healing began forty hours after tamponade and was complete in thirty days. It occurred at the expense of the adjacent renal parenchyma, which presented the following alterations: proliferation of the interlobular stroma and signs of albuminoid degeneration of the canals, revealing atrophy of a few glomeruli through the granular appearance of the protoplasm. For the purpose of organization of the catgut, a young connective tissue originated between the catgut and the renal parenchyma, adhering on one side to the increased stroma of the nearby tissue and on the other side to a tissue rich in cellular elements, fibroblasts and blood capillaries. Surgical investigation proved that catgut exercised a perfect, rapid and lasting hemostasis and favored the proliferative powers of the surrounding connective tissue. That the absence of sutures explained the better postoperative renal function was proved with the indigo carmine test after high section and exteriorization of the ureters.

Decapsulation and Renal Denervation.—In an anatomofunctional study of twenty patients, eighteen with renal decapsulation and two with renal denervation, Lozzi states that: 1. Renal decapsulation and partial renal denervation have the same vasomotor effect on the vascular system of the kidney. 2. There is no immediate or late injurious action of renal decapsulation on renal function. 3. In cases of reflex anuria, the decapsulation acts promptly in reestablishing the diuresis. 4. For chronic painful hematuric nephritis, it is actually the operation of choice. 5. In adhesion forming perinephritis with pain as well as in cases without precise indication, renal decapsulation has contributed immediate and later satisfying results. 6. In reexamined cases the indigo carmine and phenolsulphonphthalein tests revealed no injurious functional effect after renal decapsulation or partial denervation.

Research in Hemostasis, with Particular Attention to Craniocerebral Surgery.—Pacetto experimented with the grafting of living tissues in cerebral and abdominal hemorrhages. He found that the tissues adhere closely to the bleeding surface and have an efficacious hemostatic action when they are applied in hemorrhages originating in the parenchymatous organs. Of the various tissues, muscle is the most effective; next in order come the omentum and myocardium. The spleen, liver and kidney are almost void of hemostatic properties. The mechanism of this action is primarily of a chemicobiologic nature. This is demonstrated for the muscle tissue by the thoroughness of the hemostasis after removal of the tissue fragment which has determined it, and this especially in cases of serious hemorrhages. Heteroplastic transplantations of muscular tissue from live pigeons and rabbits are more active than autoplastic ones.

Deutsche Zeitschrift für Nervenheilkunde, Berlin

125: 1-116 (April 18) 1932

*Pathogenesis of Inflammatory Form of Landry's Paralysis. H. Demme.—p. 1.
*Primary Atrophy of Cerebellar Cortex. W. Kirschbaum and A. Eichholz.—p. 21.
Hereditary Predisposition in Neurotics. Maria Gebbing.—p. 45.
Polyneuritis Following Use of Abortifacient. J. W. G. ter Braak and R. Carrillo.—p. 86.

Pathogenesis of Inflammatory Form of Landry's Paralysis.—Demme reports a case of Landry's paralysis with fatal termination in four days, which occurred in a man aged 36 in connection with a tonsillitis that followed exposure to severe cold. The paralysis appeared first in the legs, a few days after onset of the tonsillitis, and was followed by paralysis of the facial and arm muscles and of the trunk. Death resulted from respiratory paralysis four days after the first appearance of paralytic symptoms. The spinal fluid examinations before death showed increased albumin and globulin content in the absence of pleocytosis. Necropsy revealed occasional lymphocytic infiltrations in the peripheral nerves, especially the perineural tissue, and slight changes in the axis cylinders; lymphocytic infiltrations were found in the spinal ganglions, the roots of the spinal nerves and the meninges of the spinal cord. The ganglion cells were, in part, in a condition of primary irritation; occasional perivascular lymphocytic infiltrations were found in the medulla oblongata. Comparing his case with the small number of similar cases reported in the literature which were thoroughly studied anatomically, the

author finds it clinically more acute than any of these, but the rapid death due to respiratory paralysis did not allow time for such severe histologic changes to take place in the nervous system as in most cases. On the basis of the extensive lymphocytic infiltrations and the changes in the spinal fluid, the author groups his case with the inflammatory form of Landry's paralysis. The etiology cannot be established because cultures of blood, spinal fluid and nerve substance remained negative. The author considers three forms of pathogenesis possible: 1. The tonsillitis effected a reduction of the immunobiologic powers of the organism, permitting the hypothetic virus of Landry's paralysis to invade the tissues or become pathogenic. 2. The agent that caused the tonsillitis produced toxins possessing a special affinity for the nervous system, analogous to postdiphtheritic paralysis. 3. Bacteria (such as the streptococci of tonsillitis) penetrated directly into the nervous system and produced the clinical symptoms. The author thinks the latter unlikely because of the anatomic substrata and the absence of pleocytosis in the spinal fluid. The only thing he recognizes with certainty is the etiologic significance of the angina following exposure to cold and the consequent reduction of the immunobiologic powers of the organism to a living or nonliving neurotropic agent.

Primary Atrophy of Cerebellar Cortex. — Kirschbaum and Eichholz describe a case of primary atrophy of the cerebellar cortex. An uncertainty in walking and standing, first noticed by the patient at about 20 years of age, increased progressively, causing him to seek medical care at the age of 49. Disturbance of coordination and equilibrium, intention tremor, halting speech and swaying gait resulted in a diagnosis of cerebellar disturbance of unknown cause. Another neurologic examination at 56 showed high grade ataxia of the arms and legs. At 59 motility had become much worse, the leg reflexes were increased, Babinski's reflex was pronounced on the left side and suggested on the right, and the abdominal reflexes were lacking. An attack of apoplexy paralyzing the right half of the body was followed by motor aphasia, fear and mental confusion. Progressive degeneration led to death shortly after. Necropsy revealed arteriosclerosis of the vessels of the brain, resulting in typical changes. The cerebellum exhibited the least arteriosclerotic changes, showing only a small focus of degeneration in the nucleus dentatus, but there was an independent disease of the cerebellum, a laminar atrophy of the Purkinje cells affecting predominantly the superior portion of the tuber vermis and the adjoining medial parts of the cerebellar hemisphere. The disease of the cerebellum, which started before the twentieth year, is to be considered as an acquired, primary, chronic progressive degeneration ending fatally through premature arteriosclerosis of the brain. The author thinks that his case corresponds clinically and anatomically to the "late cerebellar atrophy with cortical predominance" described by Marie, Foix and Alajouanine, although its onset was in youth, not middle age, as in the cases reported to date. For the pathogenesis the French authors assume a premature degeneration on the basis of infectious or toxic injury; other authors ascribe considerable importance to alcoholism. In this connection, strong misuse of alcohol for three generations in the family of the patient, and an intolerance for alcohol in the patient himself, is interesting and lends support to the author's hypothesis of a disturbance of anlage, a lack of differentiation and development of the affected parts, for which there is also some histologic evidence. How much the degenerative process is furthered by an intermediately occurring infectious disease, in this case rheumatism at the age of 20, will have to be shown by future observation of similar cases.

Klinische Wochenschrift, Berlin

11: 665-704 (April 16) 1932

Significance of Various Causal Factors for Pathogenesis and Course of Pulmonary Tuberculosis. N. P. Tendeloo.—p. 665.
*Insulin Tolerance. W. Falta and R. Boller.—p. 668.
*Insulin Tolerance in Cases of Icterus. R. Boller and K. Überrack.—p. 671.
Action of Diiodotyrosine in Treatment of Exophthalmic Goiter. A. Schürmeyer and E. Wissmann.—p. 673.
Endolumbar Puncture and Suppression of Cerebral Hyperglycemia by Insulin. Mader.—p. 676.
Influence of Physical Factors on Diuresis. L. Gedda.—p. 678.
Thallium and Anterior Lobe of Hypophysis: Their Mutual Modification in White Mice. L. Bickel and A. Buschke.—p. 679.
Indications for and Results of Splenectomy as Early Operation in Various Diseases of Blood. V. Schilling.—p. 682.
Erythrocyte Sedimentation Speed During Senility and in Diabetes Mellitus. A. J. Burkardt.—p. 686.
Reply to Preceding Article. L. Remen.—p. 687.
Elimination of Hormones of Anterior Lobe of Hypophysis in Urine During Endocrine Disturbances. E. J. Kraus.—p. 687.
Determination of Rest Nitrogen and Its Fractions. F. Rappaport.—p. 688.
Observation of Chemotherapeutic Processes Under Fluorescence Microscope. N. von Jancsó.—p. 689.
Differential Diagnosis of Lymph Cysts of Lateral Cervical Triangle. C. Nordwig.—p. 689.

Insulin Tolerance.—Falta and Boller designate as insulin tolerance the capacity to cope with administered insulin without showing hypoglycemic manifestations. On the basis of tests and observations they consider 75 units as the upper limit of the insulin tolerance of normal persons. They observed that normal persons had various degrees of insulin tolerance, but the fluctuations were confined within certain limits, and the values were much below those observed in certain cases of insulin resistant diabetes. In obese persons the insulin tolerance was not increased. Of the persons with renal diabetes who were examined, all but one showed a normal insulin tolerance, and in this one case the symptoms were not entirely clear. In febrile conditions the insulin tolerance was sometimes increased. A relationship between the height of the insulin tolerance and the pyknic or asthenic constitutions was not observed.

Insulin Tolerance in Icterus.—Boller and Überrack tested the insulin tolerance of seventeen patients with various disorders of the liver. It was found that patients with impairment of the parenchyma of the liver had an insulin tolerance that was far above the normal. In many cases there was a noticeable parallelism between the galactose test and the insulin tolerance. The authors think that the insulin tolerance test can serve as a functional test of the liver.

Medizinische Klinik, Berlin

28: 605-638 (April 29) 1932. Partial Index

Growth Manifestations. G. Bessau.—p. 605.
*Spontaneous Filling of Ventricles with Air When Cistern Puncture Is Done in Sitting Position. G. Schaltenbrand.—p. 609.
Aspects of Solitary Metastatic Arteriogenic Abscess of Liver. L. Sussi.—p. 611.
Pathogenesis of Funnel Chest. E. Flusser.—p. 612.
Differential Diagnosis of Diseases of Mouth, Jaw and Teeth. W. Weinberger.—p. 615.
Biliary Disorders in Course of Reducing Cures. Géza Hetényi.—p. 616.
Significance of Inflammatory Hyperemic Connective Tissue During Embryonal Life for Genesis of Malformations. A. Löwenstein.—p. 617.

Spontaneous Filling of Ventricles with Air.—Schaltenbrand shows that if cistern puncture is done while the patient is in the sitting position, the pressure in the cistern is usually negative and air enters into the ventricle or into the subdural space. This spontaneous filling with air is often sufficient for an encephalography. In occipital encephalography it is usually not necessary to inject air into the cistern, for it is sufficient to withdraw a quantity of fluid equal to the quantity of air that is to be introduced. In suitable cases, and if done by an experienced physician, this method is less dangerous and less unpleasant for the patient than encephalography by lumbar puncture. If spontaneous air filling is to be avoided in cistern puncture, the puncture has to be made while the patient is lying down.

Münchener medizinische Wochenschrift, Munich

79: 661-700 (April 22) 1932. Partial Index

Morphologic Characteristics of Skin and Constitution. S. Bettmann.—p. 661.
Syphilis and Pregnancy. K. Zieler.—p. 663.
*Essential Hypochromic Anemia (Achylic Chlorosis) and Its Relations to Pernicious Anemia. H. Schulten.—p. 665.
Backache in Women. M. Samuel.—p. 667.
*Can Latent Tuberculous Foci Become Activated by Single Roentgenoscopy of Lung? N. Tsamboulas.—p. 671.
Treatment of Furuncles with Soap. H. von Baeyer.—p. 677.
Treatment of Rheumatic Polyarthritis and Its Complications with Large Doses of Amidopyrine. Ilse Leber.—p. 677.
Method of Qualitative Determination of Dextrose in Urine by Means of Potassium Permanganate. I. B. Schur.—p. 679.

Essential Hypochromic Anemia and Its Relations to Pernicious Anemia.—It is pointed out by Schulten that the chronic cryptogenic anemias with hypochromic blood picture

and with anacidity or with subacidity, which frequently develop in middle-aged women, have so much in common that they may be considered as a disease entity. Of the many terms that have been suggested in the literature, the author considers the designation "essential hypochromic anemia" as most suitable. The differentiation from pernicious anemia is necessary for a correct and effective therapy, for hypochromic anemia requires treatment with large doses of iron, whereas pernicious anemia requires liver therapy. Because of the therapeutic importance of the differential diagnosis, the author not only discusses the characteristic symptoms of hypochromic anemia but also gives a comparative table in which the corresponding symptoms of the two types of anemia are given in opposite columns. The table indicates that the color index, which is increased in pernicious anemia, is reduced in essential hypochromic anemia; and whereas in pernicious anemia the size of the erythrocytes is increased, it is reduced in hypochromic anemia. The table also lists differences in the number of leukocytes, in neutrophilia, in eosinophilia, in the bilirubin content of the serum, and in other morphologic and chemical characteristics of the blood in the two types of anemia. But in spite of these differences it is nevertheless probable that the two conditions are related, for they often occur in the same families and may even occur successively in the same person. The author thinks that the gastric disorder may be the common constitutional factor.

Can Latent Tuberculous Foci Become Activated by Single Roentgenoscopy of Lung?—Tsamboulas relates that occasionally apparently healthy persons, who were examined for a health certificate or for similar purposes, showed pulmonary symptoms shortly after the roentgenologic examinations. The further observation of such patients led to the assumption that a latent tuberculous process had become activated and that the irritative action of the roentgen rays was probably responsible for this activation. In order to gain some insight into this problem, the author observed carefully the reactions that followed the routine roentgenoscopy of the thorax of patients with manifest pulmonary tuberculosis. He always noted an increase in the sedimentation speed of the erythrocytes; also an increase in globulin and in fibrinogen, and a higher basal metabolic rate. In some cases there also was a slight increase in the temperature. Roentgenoscopy of the thorax of healthy persons did not produce these changes. On the basis of these and of other observations, the author concludes that it is possible that in some latent cases of tuberculosis the irritation produced by roentgenoscopy is sufficient to produce a focal reaction and thus lead to the manifestation of the disease. This assumption seems the more justified when it is considered that exposure to the sun's rays or the irritation produced by parenteral administration of protein is occasionally followed by a first manifestation of pulmonary tuberculosis in apparently healthy persons.

Virchows Archiv f. path. Anat. u. Physiol., Berlin

284: 1-338 (April 14) 1932. Partial Index

Pathologico-Anatomic Observations During Epidemic of Scarlet Fever Combined with Diphtheria. R. Stankievitcz.—p. 1.
Significance of Form of Sella Turcica in Pathogenesis of Genital Atrophy and Obesity. J. Soós.—p. 49.
Traumatic Late Apoplexy. H. Eck—p. 67.
Pathologico-Anatomic Aspects of Cerebral Injuries in Acute Poisoning with Barbital. Else Petri.—p. 84.
Significance of Functional Structure of Heart in Development of Hypertrophy and Dilatation. N. A. Podkaminsky.—p. 92.
*Polypous, Malignant, Metastasizing Endocardial Tumors and Tumor-like Thrombi of Left Auricle. W. Müller.—p. 105.
Pathology of Endocarditis Pulmonalis. H. Oelmeyer.—p. 120.
Various Forms of Primary Disease of Pulmonary Artery. H. Bredt.—p. 126.
Animal Experiments on Arteriosclerosis with Especial Consideration of Sclerosis of Coronary Arteries. E. Pfleiderer.—p. 154.
Significance of Arteriosclerosis for Development of Uremic Necroses. W. Würth.—p. 175.
*Spreading and Course of Lobar Pneumonia. H. Heinrichs.—p. 187.

Metastasizing Endocardial Tumors of Left Auricle.—Müller describes four cases of so-called myxomas of the left auricle, which macroscopically showed certain similarities but the microscopic examination of which revealed entirely different structures. In the first case there existed a malignant growth with metastases; in the second instance the tumor showed the aspects of a myxoma; in the third case there existed a thrombus, and in the fourth case a portion of a sarcoma of the cardiac wall had grown into the auricle. All cases showed their own typical structure and revealed no transition stages from thrombus to tumor. On the other hand, the possibility of a tumor-like transformation of thrombi cannot be entirely excluded. The changing pressure and blood current in the left auricle exert a considerable influence on the macroscopic as well as on the microscopic formation of the growths.

Course of Lobar Pneumonia.—Heinrichs found that lobar pneumonia spreads not merely by the lymphatic route but also by direct continuity. Spreading by the bronchial route produces primarily metastases in other lobes. Working independently of Löschke, the author reached about the same conclusions. In the alveoli in the beginning stage of lobar pneumonia there is edema with bacteria, and a congestion of the alveolar vessels. This hyperemia increases with the further exudation of leukocytes and of alveolar epithelium. When the alveolus is filled with cells, the blood vessels become empty. With increased exudation of fibrin and the disappearance of leukocytes, the blood slowly returns to the vessels, so that in the stage when the fibrin shrinks the capillaries again become distended. In this stage diapedesis hemorrhages are frequent, whereas in the beginning stage of pneumonia hemorrhages into the alveoli are not the rule. The fibrin is not dissolved, as was formerly believed, by the leukocytes or their ferments, but it shrinks and in the resorption the alveolar epithelium plays an important part. The main function of the leukocytes in the beginning of the disease process is the destruction of the bacteria. The author was not able to corroborate Löschke's differentiation in stages. In none of the thirty-five cases that he observed did the stage of the so-called red hepatization follow the gray hepatization, but he always noted the red hepatization (not really red, but more grayish red) in the beginning.

Wiener Archiv für innere Medizin, Vienna

22: 161-320 (April 15) 1932

*Diagnosis of Abdominal Cysts with Aid of Pneumoperitoneum. R. Boller and R. Pape.—p. 161.
Hemialgia. A. J. Heymanowitsch and G. D. Leschtschenko.—p. 177.
*Clinical Aspects of Systematic Amyloidosis. W. Mollow and Lebell.—p. 205.
*Relations Between Articular Rheumatism and Tuberculosis. W. Loewenstein, A. Strasser and A. Weissmann.—p. 229.
Pulmonary Cancer. D. Sučić.—p. 255.
Influence of Gastric Acidity on Sugar Tolerance Test. R. Boller and K. Überrack.—p. 307.
Test of Function of Liver by Means of Intravenous Administration of Solution of Galactose. S. Pollak.—p. 317.

Diagnosis of Abdominal Cysts with Aid of Pneumoperitoneum.—Boller and Pape describe three cases of cysts in the abdominal cavity. In two instances the otherwise unclear diagnosis was made clear by air inflation. The author considers the absolute rejection of the inflation of the abdominal cavity for diagnostic purposes as not justified. He admits that meteorism and chronic ileus are contraindications but thinks that, if these conditions can be excluded, the inflation with relatively small amounts of gas (from 800 to 1,200 cc.) does not involve greater dangers than an abdominal paracentesis or an artificial pneumothorax. He considers abdominal inflation especially helpful in the differentiation between ascites and cysts or in the detection of their simultaneous existence. If a cyst is present, its puncture is not dangerous, provided it is immediately followed by the operation. As a rule the puncture canal in the wall of the cyst closes again, before the cystic content escapes into the abdominal cavity. The author considers inflation also advisable in cases in which palpation does not reveal the presence of fluid in the abdominal cavity, or when the usual roentgen examination is not sufficiently clear.

Clinical Aspects of Systematic Amyloidosis.—A review of the literature on amyloidosis revealed to Mollow and Lebell that most reports on this disorder were published by pathologists who discussed the pathologic aspects, whereas the clinical picture was given little consideration. They therefore describe the clinical history of a farmer, aged 60, who complained of abdominal pains and constipation. His tongue became enlarged, he had difficulty in swallowing and in speaking, and walking became difficult. During the three months of clinical observation, the changes in the abdomen and in the muscles were especially noticeable. The abdomen was always meteoristic, and

there was spastic constipation. The musculature showed irregular changes. Whereas the tongue was greatly enlarged and finally revealed superficial ulceration, the other muscles, particularly those of the back and of the legs, were tensely stretched and hypertonic. The protruding muscles gave the man the appearance of an athlete. The hypertonia of the muscles was continuous and not merely a myotonic reaction. On the skin small, soft nodules were noticeable, which gave the skin an uneven appearance. The hypertonia of the muscles increased and the abdominal pains persisted, particularly on the left side. Gradually the symptoms of a cardiac weakness developed and the patient died as a result of myocarditis. The diagnosis was not definite until after the postmortem histologic examination. The histologic report revealed that the amyloid was not deposited in the organs in which it is usually found, but rather in the muscles. On the basis of this characteristic the authors feel justified in classifying this case with the systematic amyloidosis as described by Lubarsch. The peculiarities of this form of amyloidosis are (1) the absence of the cause to which amyloidosis is usually ascribed; (2) the absence of amyloid deposits in organs that are usually involved, and (3) the different behavior toward the usual staining methods for amyloid. The etiology of this form of amyloidosis is still not definitely established, but the authors think that it is the result of a disturbance in the protein metabolism.

Relations Between Articular Rheumatism and Tuberculosis.—Loewenstein and his associates call attention to the fact that studies on the etiology of acute articular rheumatism have repeatedly pointed toward tuberculosis. In recent years, Reitter and E. Löwenstein have considered acute articular rheumatism as a manifestation of the action of the tubercle bacillus, because they noted a tubercle bacillemia in a considerable number of such cases. Statistical investigations on the frequency of the concurrence of articular rheumatism with tuberculous disorders, however, indicated a great rarity of such a concurrence, namely, only 1 per cent. Blood cultures that were made by E. Löwenstein in fifty-one cases of articular rheumatism which were under the authors' care, revealed a tubercle bacillemia in 34.4 per cent of the cases, but the authors reason that the concurrence of tubercle bacillemia and of articular rheumatism does not necessarily indicate a causal connection between the two, and the critical evaluation of their material does not justify the assumption of a causal relation. They think that infectious arthritis develops on the basis of a sensitized mesenchyme and that the sensitization in turn may have been produced by any infection, including tuberculosis.

Zentralblatt für Chirurgie, Leipzig

59: 1089-1136 (April 30) 1932. Partial Index

*Does Hormone of Thyroid Protect Against Thrombosis and Embolism? C. Atanasof.—p. 1090.
*Ova of Tapeworm as Cause of Periproctitic Abscess. P. Rosenbaum. —p. 1093.
Helpful Technical Maneuver in Endless Probing. A. Kummant.—p. 1096.
Time of Operative Intervention in Pneumococcic Peritonitis in Children. W. Obadalek.—p. 1101.
Ambulatory Treatment of Hydrocele According to Kirschner's Method. K. Kettel.—p. 1103.
Hidden Abscesses of Both Tonsils as Cause of Streptococcic Peritonitis Following Appendectomy. E. Sereghy.—p. 1108.

Does Hormone of Thyroid Protect Against Thrombosis and Embolism?—Atanasof cites evidence against the assertion that thrombosis and embolism are never observed following operative interventions for exophthalmic goiter and he points out that his observations on fatal thromboses and embolisms following goiter operations also prove that the thyroid hormone is of no practical value for the prophylaxis of postoperative thrombosis and embolism. That thromboses and embolisms are comparatively rare after interventions for exophthalmic and other goiters, he thinks due to another factor than the thyroidal hormone, for they are rare after all operations on the neck and head. For this there is as yet no satisfactory explanation, but the problems of thrombosis and embolism, the pathogenesis as well as the prophylaxis, are likewise still unsolved and have to be further investigated.

Ova of Tapeworm as Cause of Periproctitic Abscess.—Rosenbaum relates the clinical history of a woman, aged 30. On the basis of the first examination, the condition was diagnosed as a periproctitic abscess with an infiltration above it. To be sure, the characteristic aspects of an acute inflammation and of disintegration were absent, and the pus revealed the typical behavior of neither an acute nor a chronic abscess. The upper infiltration had no connection with the abscess. There was no increase in temperature, and the peculiar clinical aspects induced the author to have a part of the abscess wall examined microscopically. The presence in the tissue of ova of taenia caused surprise, as it could not be readily explained how the ova had reached those tissues. Since the ova have no motility of their own and a penetration of the mucosa of the colon can be excluded, they may have reached there by way of an incomplete fistula that had healed in the meantime. Another possibility is that, as a result of an accidental injury of the mucosa, they were pressed into the tissue and, because they were laden with infective material, they did not heal in but caused infiltration and abscess formation. Microscopic examination revealed that besides entirely intact eggs there were also some which showed the aspects of necrosis. This indicates that at least a part of the eggs were destroyed by the changes in the biologic conditions. Thus it may be assumed with considerable certainty that the ova, which were laden with infectious although not highly virulent material, caused a slow infiltration and abscess formation. This mode of pathogenesis of a periproctitic abscess has a certain resemblance to that of a tuberculous periproctitis, the more so because microscopic examination revealed giant cells and epithelioid cells. In the conclusion the author advises that for therapeutic as well as for scientific reasons the abscess wall should be excised, whenever periproctitic suppurations show unusual clinical aspects, for thus not only the largest portion of the parasitic ova are removed but material is obtained for microscopic examination.

Zentralblatt für Gynäkologie, Leipzig

56: 1025-1088 (April 23) 1932. Partial Index

Clinical Significance of Uterine Epithelial Proliferations of Hypophyseal Origin. J. Hofbauer.—p. 1026.
*Necessity for Caution in Therapeutic Use of Preparations of Anterior Lobe of Hypophysis. J. Hofbauer.—p. 1032.
Granulosa Cell Tumor: Case. H. Dworzak.—p. 1033.
Problem of Interruption of Pregnancy in Addison's Disease. M. Addison.—p. 1039.
*Ulcer Following Injury with Ball Forceps. H. Hinselmann.—p. 1042.
Glycogen Content of Myomatous Tumors of Uterus. E. Petrowa. —p. 1045.

Therapeutic Use of Preparations of Anterior Lobe of Hypophysis.—Hofbauer directs attention to the dangers involved in medication with preparations of the anterior lobe of the hypophysis. In guinea-pigs, in which both ovaries had been removed and which then were treated by intraperitoneal injection of hypophyseal extracts or by transplantation of parts of the hypophysis, he noted a considerable enlargement of the vital organs, especially of the heart and kidneys, which had grown to about twice their normal size. The enlargement of the liver and of the spleen was less noticeable. He advises that if a prolonged medication with the hormone of the anterior hypophysis is necessary one should be careful with the hypophyseal preparations that contain the growth hormone, especially in cases presenting deficient ovarian action. The hypophyseal preparation obtained from the urine during pregnancy supposedly does not contain the growth hormone and would therefore be less dangerous for the heart and kidneys. On the other hand, it is also understandable that the preparation that does not contain the growth hormone will be useless to influence genital hypoplasia.

Ulcer Following Injury with Ball Forceps.—Hinselmann points out that in the differential diagnosis of circumscribed ulcers of the cervix uteri a possibility should receive attention that formerly has not been considered. He observed a cervical ulcer in a woman in whom the uterus had been curetted following an abortion. The negativity of the Wassermann reaction excluded the possibility of a primary syphilitic lesion and the surface of the ulceration did not indicate a carcinomatous lesion. Another case of a cervical ulceration came under the author's observation, and the ulcer was excised and subjected to histologic examination. Thus it was found that the ulceration was not carcinomatous. In this instance no other etiology was possible but that the torpid ulcer was the result of

an injury caused by the ball forceps that had been used in this case. Consequently the same origin is assumed for the other case. Examinations in numerous cases convinced the author that such cases are comparatively rare, but he thinks that the possibility of this etiology should be considered in cases of cervical ulcers.

56: 1089-1136 (April 30) 1932

Malformation of Urinary Bladder in Two Fetuses. R. Meyer.—p. 1090.
*Treatment of Vesicovaginal Fistula by Laparotomy. E. Vogt.—p. 1105.
Traumatic Rupture of Bladder During Puerperium. F. C. van Tongeren.—p. 1109.
Vaginal Calculus in Case of Vesicovaginal Fistula. P. Esau.—p. 1110.
Therapy of Ureteral Fistula. W. Sigwart.—p. 1113.
Primary Ureteral Carcinoma. E. Navratil.—p. 1116.
*Differential Diagnosis Between Appendicitis and Painful Ureteral Stasis or Pyelitis During Gravidity. P. Schumacher.—p. 1120.

Treatment of Vesicovaginal Fistula by Laparotomy.—Vogt first relates a clinical history which indicates that under certain conditions a laparotomy may be employed with success for the treatment of a vesicovaginal fistula, especially in cases in which the uterus has been extirpated and the vaginal route is no longer passable. This case also shows that during the after-treatment the permanent catheter can be dispensed with, for the catheter was removed on the sixth day following the operation. The second case described by the author is significant because it shows that suture of the bladder can be tried even when an ovarian carcinoma has spread to the bladder. The preceding roentgen irradiation with the carcinoma dose apparently did not influence the adhesion capacity unfavorably. For the healing process it is particularly important that the suture of the mucous membrane and of the musculature of the bladder is covered extensively with peritoneum that to some degree is still healthy and somewhat movable, so that wide peritoneal surfaces adhere to each other. Only thus is it possible to effect a complete closure of the vesical defect toward the abdominal cavity.

Differential Diagnosis Between Appendicitis and Pyelitis During Gravidity.—Schumacher points out that elimination pyelography has been recommended for differential diagnostic purposes in pregnant women, especially in disorders that are accompanied by signs of peritoneal irritation, such as cases of pyelitis or of the prepyelitic condition of ureteral stasis. These conditions may be mistaken for appendicitis, and those that recommend elimination pyelography for these cases claim that this is the only reliable method to prove that appendicitis is absent and thus prevent a laparotomy, which may prove fatal for the existing pregnancy. The author, however, disagrees with this attitude, for in the course of elimination pyelographies on 450 pregnant women he came to the conclusion that, although intravenous pyelography gives a clear picture of the physiologic and pathologic urinary tract of pregnant women, it does not aid in the differentiation between appendicitis and urinary stasis. The rejection of this diagnostic method the author bases on the following observation: The ureter, the tonus of which is reduced as a result of pregnancy, always appears dilated after the fifth month of pregnancy, as a result of the pressure from the uterus. The degree of dilatation varies, but the right ureter is usually more dilated than the left one, because of the greater uterine pressure on the right side. In the majority of cases the dilatation does not cause the slightest discomfort; but the pyelogram does not indicate this, nor does it reveal whether the urine is infected or not. The author warns that even if the pyelogram reveals considerable stasis of the right ureter, symptoms indicative of appendicitis should not be interpreted hastily as painful urinary stasis, since such a conclusion would involve the danger that an acute appendicitis is overlooked. As the best differential diagnostic method for such cases he recommends ureteral catheterization. Care should be taken that the catheter is pushed at least 20 cm. beyond the ureteral ostium, so that the point of the catheter reaches above the site of compression and into the dilated portion. If the pains disappear after the urine has been discharged by catheterization, the stasis was the cause; but if appendicitis-like symptoms persist after that, operation should not be further postponed. If the urine is infected, the catheterization brings in mild cases usually some relief, but in cases of severe pyelitis the result is not sufficiently prompt to be of differential diagnostic value.

Russkaya Oto-Laryngologiya, Leningrad

24: 429-524 (number 6) 1931

Changes in Organ of Hearing Under Influence of Noise. S. S. Grobshtein and A. V. Kugaro.—p. 429.
State of Organ of Hearing and Upper Respiratory Tract in Machine Department of Volzhsk Power Plants. L. I. Yakub.—p. 450.
"Subjective Auscultation" of Mastoid Process. L. T. Levin.—p. 455.
Inflammation of Middle Ear in Influenza Epidemic of 1927-1928. D. M. Rutenburg.—p. 458.
*Practical Value of Double Rotatory Test ("Otolithic Reaction") in Aviation. M. S. Mikhelovich.—p. 472.
*Friel Ionization with Zinc as Method of Treatment of Chronic Otitis. A. F. Pushkin.—p. 487.
The State of Follicular Apparatus in Lacunar Angina. N. A. Krukov.—p. 500.
Esophagotracheal Fistula with Cancerous Development. M. E. Gindes.—p. 507.
Autohemotherapy in Ozena and Atrophic Rhinitis. V. I. Strelova.—p. 510.

Practical Value of Double Rotatory Test in Aviation.—Mikhelovich states that the "otolithic reaction," first described by Voyachek in 1927, is a modification of the Bárány test. There are two parts to the test: In the first part, the patient sits in a Bárány chair with the head held in a vertical position; then he is rotated ten times in twenty seconds or five times in ten seconds, whereupon he is stopped and the period of the nystagmus is recorded. In the second part, the patient is rotated with the head bent, is stopped, and after a pause of five seconds lifts his head, and without other change in position of the head (1) the duration of the nystagmus and then (2) the various dynamic reactions of the sympathetic system are noted. Reverting to the schools of thought represented by Quix, Magnus and de Klejn, and the experimental results of his own laboratory, Voyachek believes that the movement of the otoliths in the second part of the test has a sensitizing or activating influence on the labyrinthine reaction: (1) The irritation of the nerves of the otolithic apparatus is unspecific and is a mechanical result of the movement of the otoliths at the ends of the nerves of this apparatus; (2) the otolithic apparatus stands in close functional relationship with the system of semicircular canals. Five years' work in the commission appointed to study the criteria in the selection of candidates for the schools of aviation and the physiologic principles underlying such a capacity leads the author to conclude that the otolithic reaction of Voyachek needs further study. The test is an indication of the general condition of the otolithic apparatus and does not isolate specific disturbances of individual canals. Nystagmometry is not the only or the most accurate criterion for aptitude in aviation. The otolithic reaction is not sufficiently accurate nor standardized for use in aptitude tests in aviation. It is true that the test of a good aviator does not depend on some kind of a specialized function of the vestibular apparatus but, rather, on a normal condition of the whole labyrinth. Static sensation is not due to some specialized organ but, rather, to several organs of sensation. One should not speak of "static sensation" but, rather, of the "elements of static sensation." The medical specialist should be instructed in the pathologic and the usual normal variations in the labyrinthine-otolithic reaction.

Friel Ionization with Zinc as Method of Treatment of Chronic Otitis.—Pushkin describes a method of iontotherapy for chronic otitis first recommended by Friel in 1921. The ear, which serves as an electric cell, is filled with a solution consisting of 0.5 per cent zinc sulphate, 5 cc. of glycerin and 100 cc. of distilled water. The positive zinc electrode is placed in this solution through a small ebony funnel (the tip of the electrode just 0.25 cm. above the bottom of the tip of the funnel), and the indifferent negative electrode, insulated in tin foil and well protected, is tied to the shoulder or arm. The electric current is transformed through a rheostat. There must be a regular flow of current with a potential of from 40 to 50 volts and an intensity of not more than 3 milliamperes. Most of the treatments consisted of a current of 2 milliamperes, and the current was applied for from ten to fifteen minutes. The average number of treatments was three. The author treated forty patients this way and concludes that ionization offers the best method for the treatment of the infectious process and that its influence is directly on that process. The action seems due to the nascent state of the medicaments,

which come in close contact with the diseased tissue and gradually coagulate it. The action of the ions is specifically on the pathologic tissue and reaches parts of the ear that are inaccessible by other methods of treatment; the electric current at the same time influences the cellular tonicity. This method of treatment is recommended by reason of its rapidity and its efficacy.

Hygiea, Stockholm

94: 209-256 (March 31) 1932

*Atypical Tuberculous Meningitis. P. Butler.—p. 209.

Atypical Tuberculous Meningitis.—In nineteen cases cited by Butler, tuberculous meningitis had at some stage simulated or caused confusion with cerebellar tumor (three patients operated on), cerebral abscess together with chronic otitis (operation), compression myelitis (laminectomy), sarcomatosis of cerebral meninges (puncture of ventricles), acute polyarthritis with transient paralysis of bladder, epidemic meningitis, and poliomyelitis in the preparetic stage. He says that the focal symptoms seem usually to appear after meningeal signs have set in, when diagnosis generally is not difficult, unless the focal symptoms dominate the clinical picture. However, the focal deficiency phenomena may constitute the initial symptoms, and a longer or shorter period may elapse before the symptoms proper of meningitis appear. With a fever-producing tuberculous process in other organs, rapidly supervening focal symptoms from the central nervous system may be the first sign of meningitis. There were instances of meningitis with remissions, in which grave focal lesions disappeared without recurring in the later stage of the disease.

Nordisk Medicinsk Tidskrift, Uppsala

4: 225-240 (April 9) 1932

Aid in Method for Determination of Strength of Cutaneous Capillaries and for Indirect Estimation by Such Determination of Individual Vitamin C Standard. G. F. Göthlin.—p. 225.
*Erythema Nodosum. H. Ernberg.—p. 230.

Erythema Nodosum.—Ernberg studied erythema nodosum and its connection with tuberculosis in more than 200 cases, largely in children. In an unbroken series of thirty-nine closely examined unselected cases of erythema nodosum, all the patients were found to have tuberculous infection, mostly with directly demonstrable tuberculous foci, chiefly in the pulmonary region. His various results lead him to explain erythema nodosum as an autogenous tuberculin reaction of the organism, and he concludes that the condition must practically be regarded as tuberculosis. No examination in cases of erythema nodosum, he says, is complete without roentgen examination. The condition calls for treatment of the tuberculosis, is a signal to search for the source of infection in the patient's environment, and permits study of the course of tuberculosis in certain forms in its earliest stages. The prognosis for tuberculosis with erythema nodosum is, as a rule, good.

Norsk Magasin for Lægevidenskapen, Oslo

93: 353-480 (April) 1932

*Psychic Disturbances in Multiple Sclerosis. H. Sæthre.—p. 353.
Focal Infection: Blood Picture and Sedimentation Reaction in "Rheumatic" Conditions of Muscles and Joints; Bacteriologic and Pathologic-Anatomic Investigation of Foci of Infection, Particularly Tonsillar and Dental. H. Bjørn-Hansen.—p. 378.
*Operative Treatment of Fractures of Diaphysis of Femur: After-Examination. N. H. Brodersen.—p. 403.
Mesenteric Cyst (Sarcoma with Cyst Formation). J. Kaarstad.—p. 418.

Psychic Disturbances in Multiple Sclerosis.—Sæthre reports twelve cases of multiple sclerosis with psychic symptoms. In eight there were grave psychotic changes, in two with marked dementia. The remaining four showed the "common polysclerotic mental state" (Ombredane) characterized by euphoria, slight dementia, marked emotional lability, and sensitive egocentricity. The most important mental disturbances in multiple sclerosis are emotional instability and dementia. The dementia may appear early and without particularly marked neurologic symptoms. In only one case did the psychosis almost entirely disappear.

Operative Treatment of Fractures of Femur.—From his after-examinations in sixteen patients (with seventeen fractures) out of the twenty-eight (with twenty-nine fractures) treated from 1919 to 1929, Brodersen concludes that when in fractures of the diaphysis of the femur other treatment is ineffective (and possibly as the first treatment in complicated fractures) osteosynthesis according to Lane gives good anatomic and functional results. The drawbacks otherwise noted after osteosynthesis (osteitis, pseudo-arthroses, delayed consolidation) seem to be unimportant in fractures of the femur.

93: 1-342 (April) 1932. Supplement

*Surgical Conditions of Pancreas. O. Usland.—p. 1.

Surgical Conditions of Pancreas.—On the basis of the cases of pancreatic disorders and pancreatic complications seen among the 3,000 patients treated by him from 1924 to 1930 and of the Norwegian literature on pancreatic diseases, Usland discusses pancreatic diseases in Norway, their clinical symptoms, diagnosis and treatment, with constant comparison with experiences from other countries.

Svenska Läkaresällskapets Handlingar, Stockholm

58: 1-72, 1932

*Steam Disinfection: 1. Investigations on Resistance of Spores of Anaerobic Bacteria to Heating in Moist Heat. R. Bergman.—p. 1.

Steam Disinfection.—Bergman tabulates the resistance values obtained in resistance tests of spores of pathogenic anaerobic bacteria suspended in ordinary bouillon. The values were uniform, "skips" were rare, and the "dormancy" phenomenon was not exhibited. Comparison between his values and those of other investigators support the view that the nature of the suspension medium is of importance, higher values being obtained in the cultures richer in organic substances, especially in brain mediums. The varying results are ascribed to a protective action (as isolation from the steam) by certain substrates. The density of the spores seems to be of little significance, but exposure of the spores to airing, washing and the like plays an important part. Of the two factors in the thermal effect, the temperature to which the spores are exposed and the duration of the exposure, the former dominates. The age of the spores seems to be of slight importance, although younger spores are more resistant. The addition of dextrose or sodium chloride does not increase the resistance. The estimated resistance values for bacteria believed to be the most resistant of all pathogenic micro-organisms indicate that in practical sterilization a low-pressure steam (1.3 atmospheres) is applicable, but these values cannot be made the basis for practical work until the influence of the milieu factors are explained.

Ugeskrift for Læger, Copenhagen

94: 399-428 (April 21) 1932

Otitis in Practice. C. Skovmand.—p. 399.
*Alimentary Hyperglycemia in Certain Infectious Diseases. A. Brems.—p. 403.
Injury to Health in Work with Melted Pitch. S. V. Gudjonsson.—p. 407.
*Diverticulum of Esophagus: Three Cases. J. Nordentoft.—p. 409.
Stomach Lavage in Children with Surgical Tuberculosis. A. Dorph-Petersen.—p. 412.

Alimentary Hyperglycemia in Acute Infectious Diseases.—Brems says that the oral administration of about 1 Gm. of dextrose per kilogram of body weight in patients with infectious mononucleosis, paratyphoid, undulant fever, and epidemic hepatitis was frequently followed in the acute stage by an abnormally high rise and a retarded fall in blood sugar values, believed to be a sign of universal organic intoxication. In some instances with pronounced abnormal reaction the temperature was normal. Glycosuria was often absent, even when the blood sugar rose to 200 mg. per hundred cubic centimeters or considerably more; this is ascribed to injury of the renal parenchyma. Moderately increased fasting blood sugar was occasionally seen in cases of epidemic hepatitis and undulant fever.

Diverticulum of Esophagus.—In Nordentoft's first patient, a man, aged 68, who had extreme difficulty in swallowing, roentgen examination revealed a pulsion or Zenker's diverticulum. Radical excision in one sitting with primary suture resulted in immediate uncomplicated recovery, continuing four years to date. In two other cases of lower and practically inaccessible diverticula, treatment with liquid or semiliquid diet has been helpful.